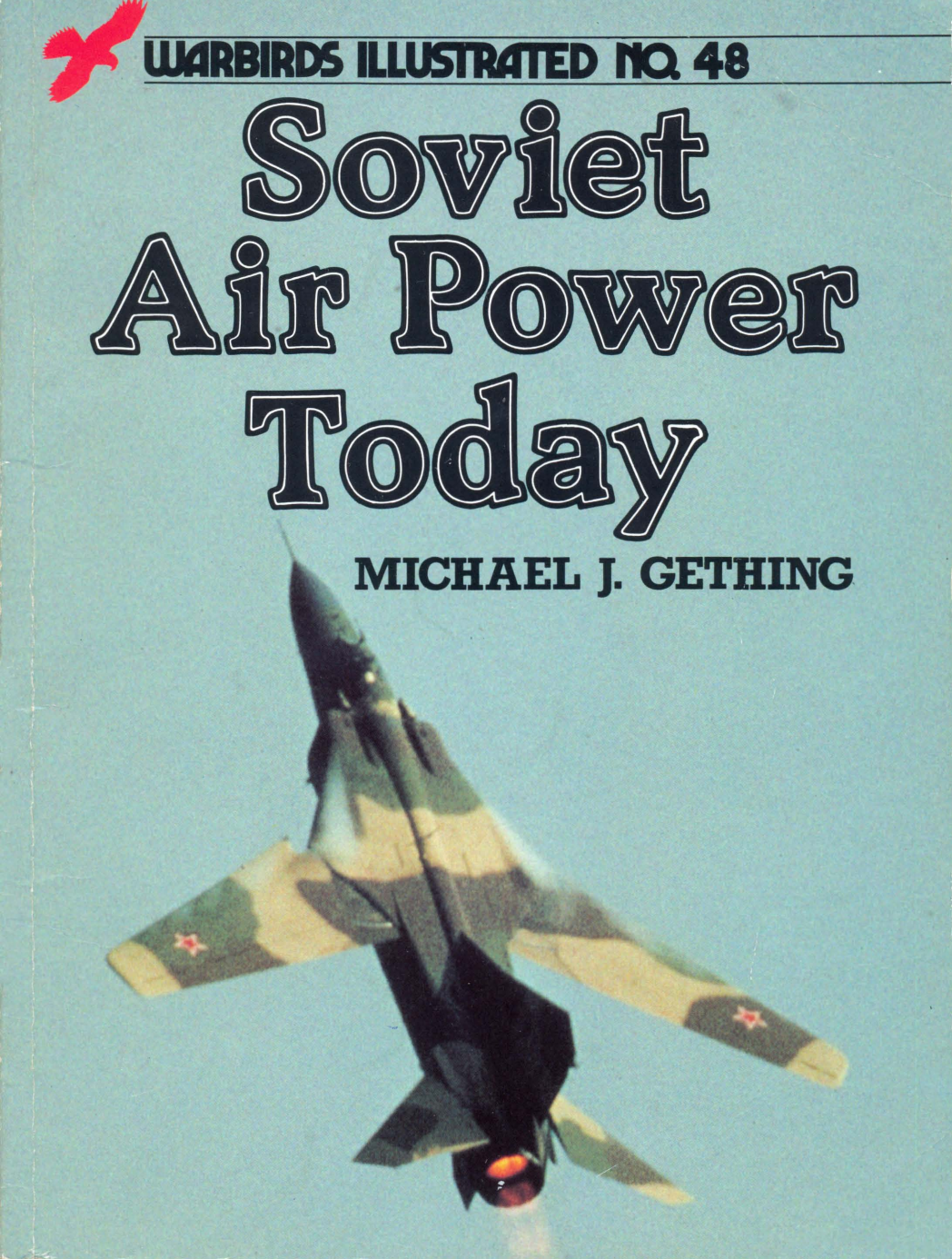
WARBIRDS ILLUSTRATED NO. 48

Soviet Air Power Today

MICHAEL J. GETHING



Cover illustration:
A MiG-23 'Flogger-G', from the evaluation unit at Kublinka, near Moscow, is boosted on take-off by its afterburner. Six of these aircraft visited Sweden in August 1981. (Uif Hugo/*Flygvapnet*)

1. Deployed in large numbers throughout the Warsaw Pact (and exported widely), the MiG-23 'Flogger' is a potent air combat fighter. This April 1986 photograph shows the MiG-23M 'Flogger-B' with weapons pylons under the fixed inboard portion of the wing and, just forward of the nosewheel, an infra-red (IR) sensor. (TASS)

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2. This October 1986 photographs shows, according to the official caption, 'a war pilot leaving the cockpit of his fighter jet landed on the airstrip of a Soviet Air Force base in the Transcaucasian Military District after training sorties'. This, by Western standards, may seem amazingly naïve but it is the Soviet way. The aircraft is a MiG-25 'Foxbat-A' or '-E' model and the angle emphasizes the nose radome housing a 'Firefox' radar. With its large, angular intakes and twin fins it was, in the author's opinion, the first Soviet aircraft to conform to the adage 'if it looks good, it is good'. It certainly surprised Western analysts at its public début at Domodedovo in July 1967. (TASS)

Introduction

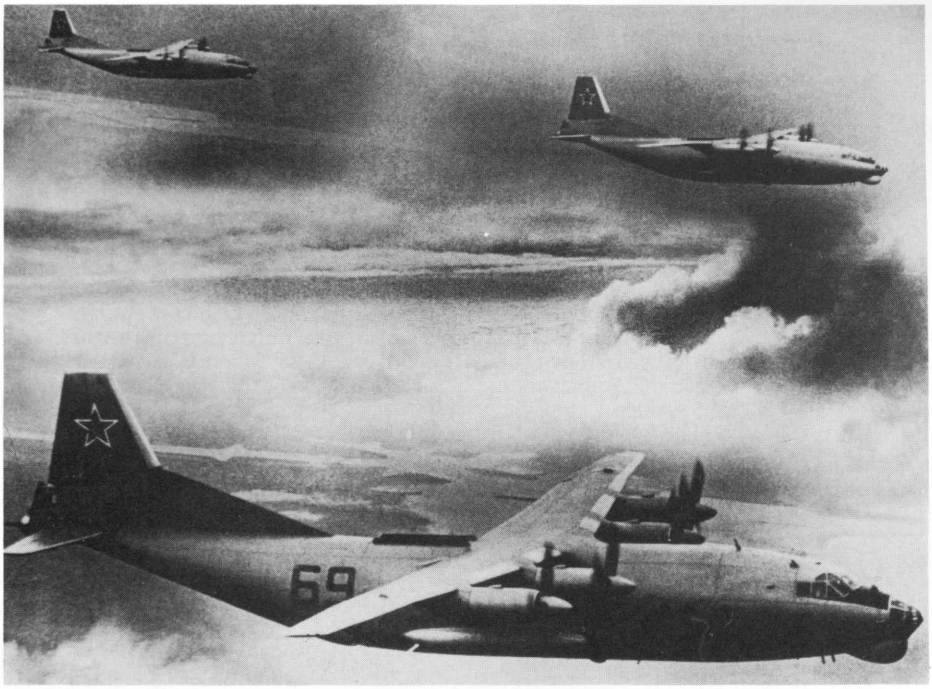
According to recently released US Department of Defense (DoD) intelligence estimates, the Soviet Air Forces have a grand total of 16,158 aircraft, while the Soviet Naval Air Force has a further 1,709. This current compilation of, principally, in-service Soviet aircraft emphasizes the fact that most Warsaw Pact military aircraft are of Soviet origin. Soviet aircraft in other Warsaw Pact nations' service are illustrated wherever possible, as are non-Soviet designs where applicable.

The US DoD publication *Soviet Military Power*, mentioned in my introduction to Warbirds Illustrated No.8, has continued to be published annually. It remains, probably, the leading non-classified source to identify new Soviet developments and to quantify Soviet military aircraft production. The current edition, for example, published in March 1987, reports that further Tupolev 'Blackjack' supersonic bombers have joined the original five pre-production models being flight-tested. Over 50 operational Tu-95/142 'Bear-H' bombers have been equipped to carry the AS-15 'Kent' air-launched cruise missile. They are routinely flown on training missions against North America, at times coming within 50 miles of the Alaskan coast. More than 300 MiG-29 'Fulcrum' fighter interceptors are now operational, while IIyushin 'Midas' tanker aircraft are now deployed, initially in support of strategic bombers. The An-124 'Condor' transport is now in full production and the 'Bear-J' naval communications relay aircraft is enhancing the command, control and communications capability of the Soviet Navy. The Soviet Navy's fourth *Kiev* Class VTOL carrier, *Baku*, is on sea trials while the larger, 65,000-ton aircraft carrier *Leonid Brezhnev* is fitting out and a second is under construction. No doubt when she begins her trials, we shall see some 'hooked MiGs and Sukhois'.

While the Soviet Union and her Warsaw Pact allies have always enjoyed numerical superiority in military aircraft, they have demonstrated great leaps in technology in recent years. No doubt the next few years will see further change. This book attempts to cover the full spread of military aviation throughout the Soviet Union. As new types have been introduced into service, older types continue to serve in diminishing numbers, and some have finally been withdrawn from service. For these reasons, several aircraft which appeared in Warbirds Illustrated No.8 have been omitted from this edition.

In the five years since Warbirds Illustrated No.8 appeared, many sources have thrown up new photographs and I am able to present a new book (one can count on the fingers of one hand the photographs which I have had to repeat from the original *Warsaw Pact Air Power* for the sake of all-round coverage). I gratefully acknowledge the assistance of the US Department of Defense, the UK Ministry of Defence, the RAF Staff College, the Royal Swedish Air Force and the Royal Norwegian Air Force in supplying photographs for inclusion. On a personal note, I would like to thank Paul Beaver, Chris Hobson, Captain Bedrich Kramer of the Czech Air Force, Frank Lancefield, John W. R. Taylor and Barry C. Wheeler for filling the few gaps in my own collection. Finally, a word of thanks to the former Soviet Air Attaché in London, Colonel Anatoly Makov and his successor, Major-General Alexi Sajine, for their own small but useful contributions.

Michael J. Gething



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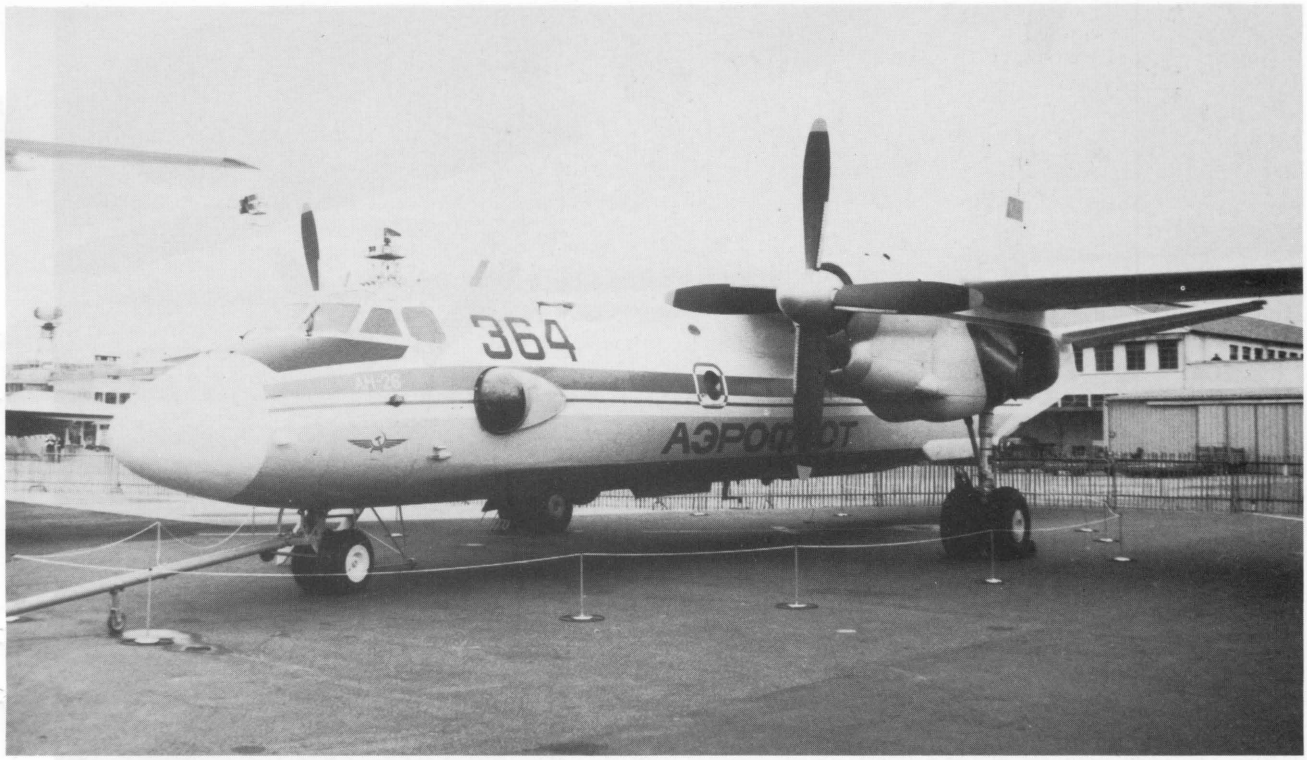
3. Roughly the equivalent of the C-130 Hercules, the Antonov An-12 'Cub' transport has been in service since 1959. Production ended in 1973 and in 1986 it was estimated that only 260 'Cubs' remained in Soviet service. Replacement with the Il-76 'Candid' began in 1974 but many hundreds are operated by other Warsaw Pact forces and by Soviet sympathizers around the world.
4. The large cargo hold and long range (3,075nm) of the 'Cub' has led to its adoption for other duties. This photograph shows the An-12 'Cub-B' elint (electronic intelligence) version as used by the Soviet Naval Air Force. It is identified by the two underfuselage radomes. (Via JASDF)
5. Initially flown in 1965 and in production until 1974, about 50 Antonov An-22 Antheus ('Cock') transports remain in Soviet service. With maximum fuel and a 99,200lb payload, it has a range of some 5,905nm, although it can carry up to 176,350lb of cargo. (US DoD)
6. Designed as general cargo/ paratroop transport, the Antonov An-26 'Curl' can carry up to 12,125lb of payload. Seen here at Le Bourget in 1977 in its civilian guise, it has also been widely exported as a military transport. (MJG)
7. Designed as a replacement for the An-2 'Colt' biplane transport, the Antonov An-28 'Cash' is now produced by PZL Mielec in Poland. This 1978 photograph shows the second, Soviet-built, pre-production aircraft fitted with Glushenkov TVD-10 turboprops (rated at 960shp) and exhibited at Le Bourget in 1979. Although basically a short-range feeder and utility aircraft, it undoubtedly has military applications. (TASS)



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8. Derived from the An-24RT/An-26, the Antonov An-30 'Clank' is a specialized aerial survey aircraft. The photographic operator is located in the glazed nose, from where he operates five cameras mounted in the fuselage. This photograph was taken at Le Bourget in the mid-1970s. (MJG)

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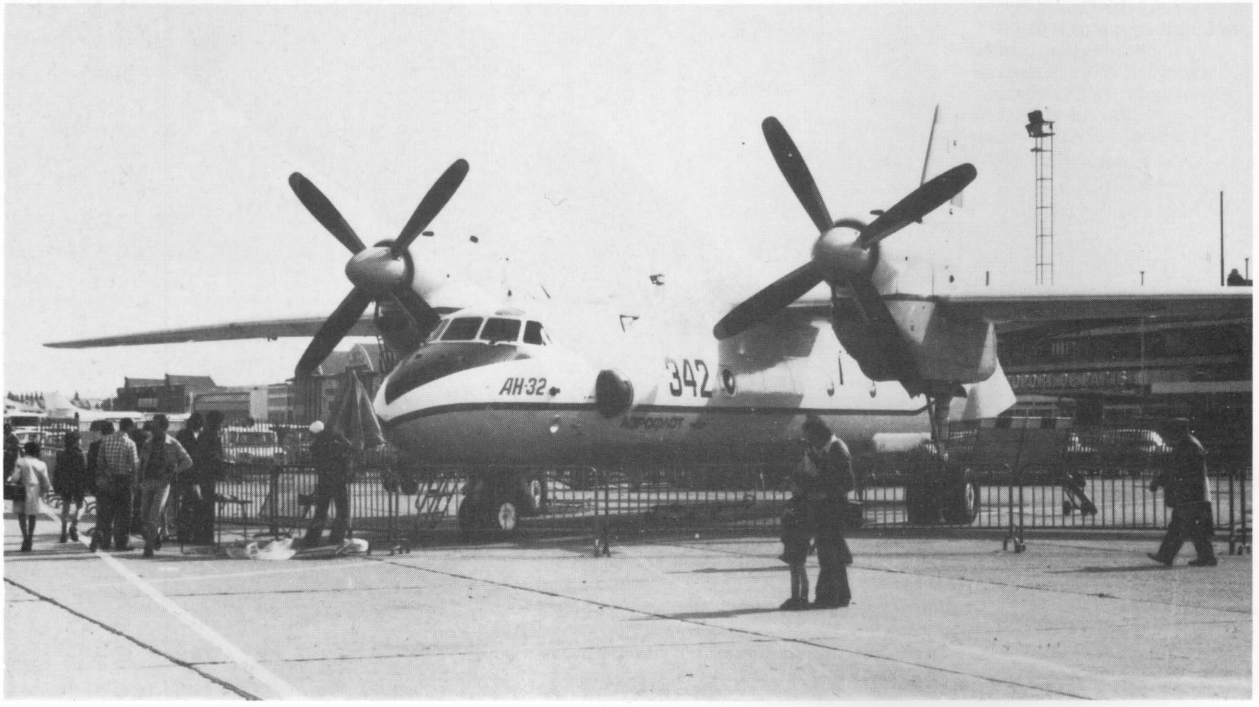
9. Evolution in transport aircraft is not uncommon, and the Antonov An-32 'Cline' is a further example of an An-26 development for 'hot and high' operations. Its maximum payload is some 14,770lb, and with this weight it has a range of 432nm. (MJG)



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10. Now known to be a development aircraft, Antonov's An-72 'Coaler' is seen here on the occasion of the first Soviet participation at the Farnborough Air Show in 1984. The production variant is known to be designated An-74. (MJG)

11. The An-124 'Condor' made its first appearance at Farnborough in 1986 and, when viewed close up, is most intimidating. Although one unit is masked by the towing bar, the nose undercarriage is a side-by-side double wheel arrangement. Like the C-5, the 'Condor' is capable of air-transporting main battle tanks. (MJG)

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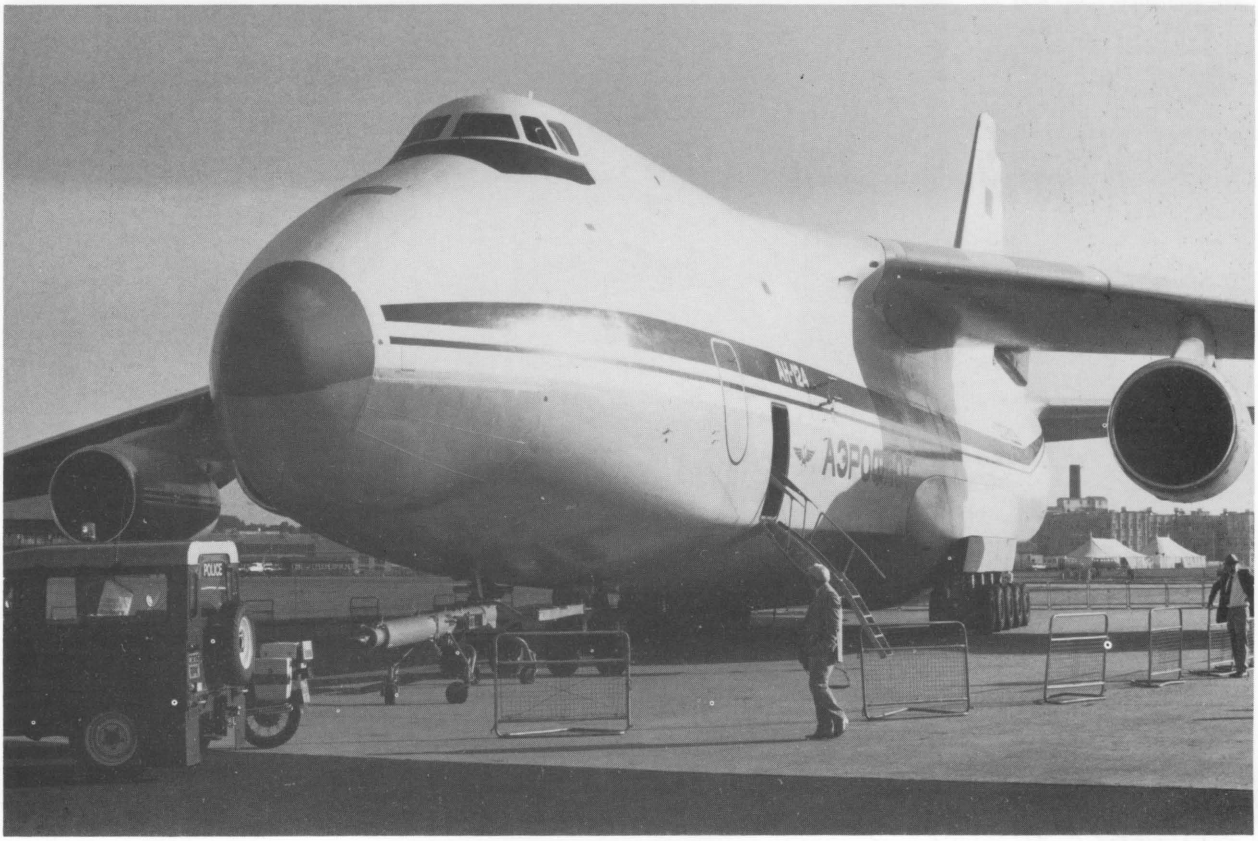

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12–15 A series of photographs showing the An-124's door-fold sequence. The nose door opens by means of an up-and-over cantilever arrangement. The photographs show the nose ramp folding and retracting into the cargo bay. (Frank Lancefield)

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16. The Iluyshin Il-20 'Coot-A' version of the Il-18 transport was first identified in 1978. It is intended for electronic intelligence (elint) and reconnaissance duties. The pods and blisters on the aircraft house various electronic sensors, while the canoe-shaped pod is understood to house a sideways-looking radar system. This photograph was taken in March 1985 by a Sea Harrier of 801 Naval Air Squadron from HMS *Invincible* (MoD-Navy)

17. The Iluyshin Il-38 'May' is another derivative of the Il-18 transport, designed for maritime reconnaissance. It has a lengthened fuselage and a nose-mounted surveillance radar. Just aft of the radar, as this photograph shows, is the forward weapons bay; a second is positioned aft of the wing carry-through structure. Some 50 'Mays' are thought to be operational in the Soviet Naval Air Force and a further three are in Indian Navy service. (RAF)

18. The Beriev Be-12 (M-12) Tchaika (NATO code-name 'Mail') is derived from the Be-6 and some 100 were built. It is used for maritime surveillance and anti-submarine warfare (ASW) duties, serving with the Soviet Northern and Black Sea Fleets. (TASS)

19. Bearing a resemblence to the US C-141A Starlifter, the Iluyshin Il-76M 'Candid' has become the major Soviet transport aircraft, replacing the An-12 'Cub'. This photograph shows the rear loading doors open with two sticks of airborne forces ready to board. Just beneath the tail can be seen a gunner's position with a pair of 23mm cannon. The Il-76 airframe has also been modified to act as an in-flight refuelling tanker, with a probe-and-drogue system, to replace the M-4 'Bisons' in service. The tanker version is code-named 'Midas'. (TASS)

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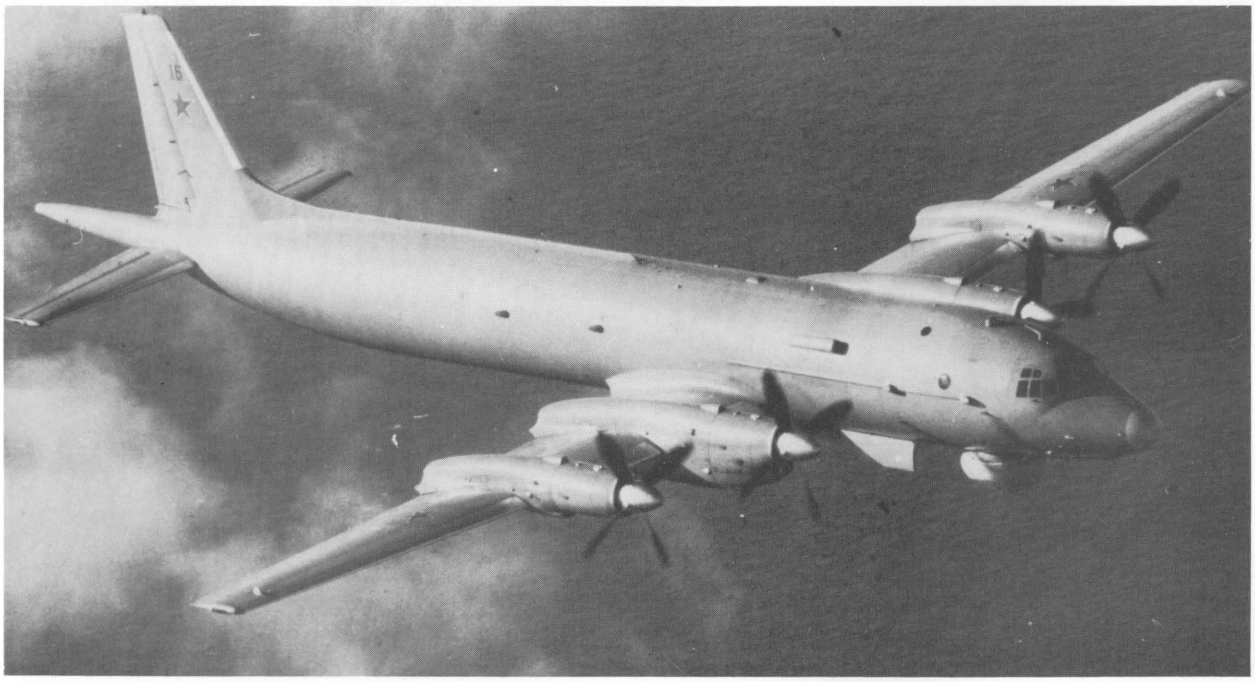

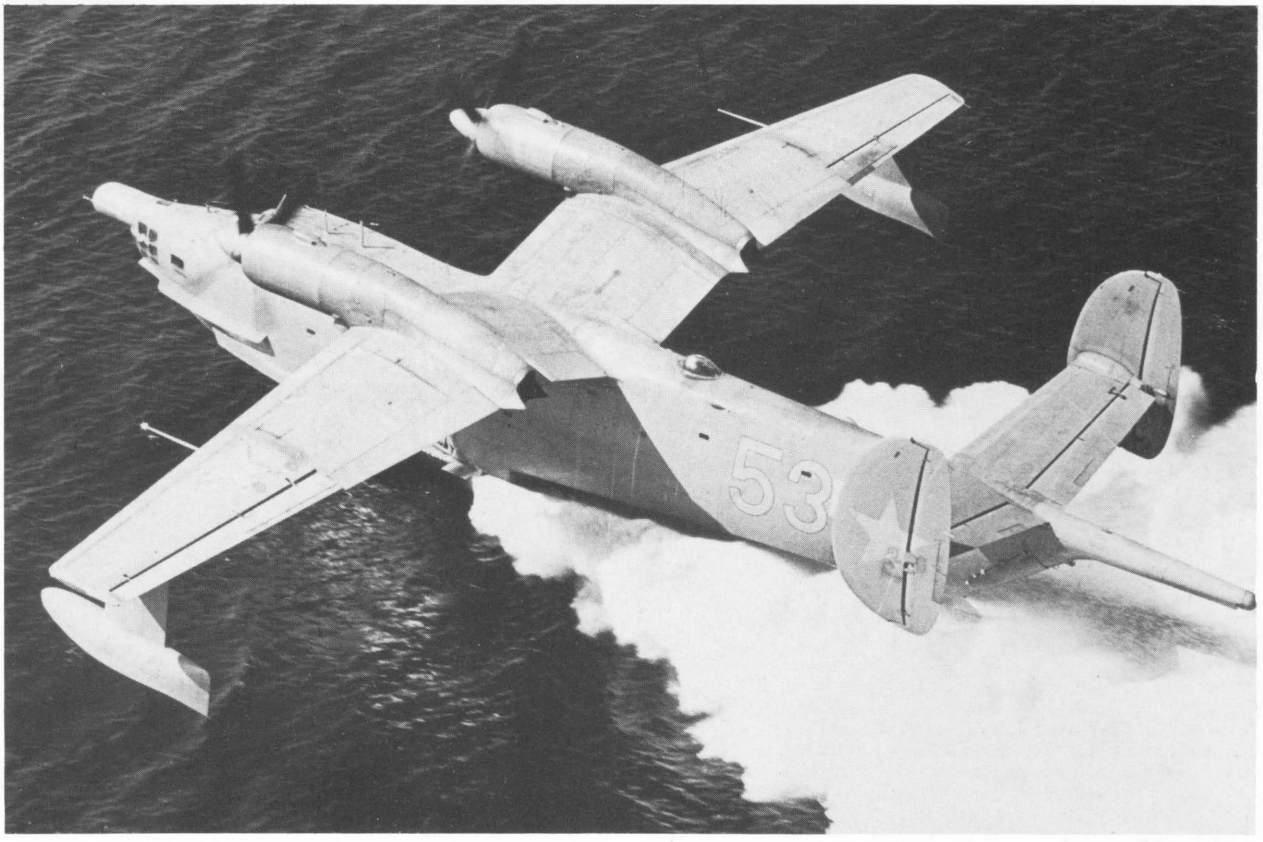

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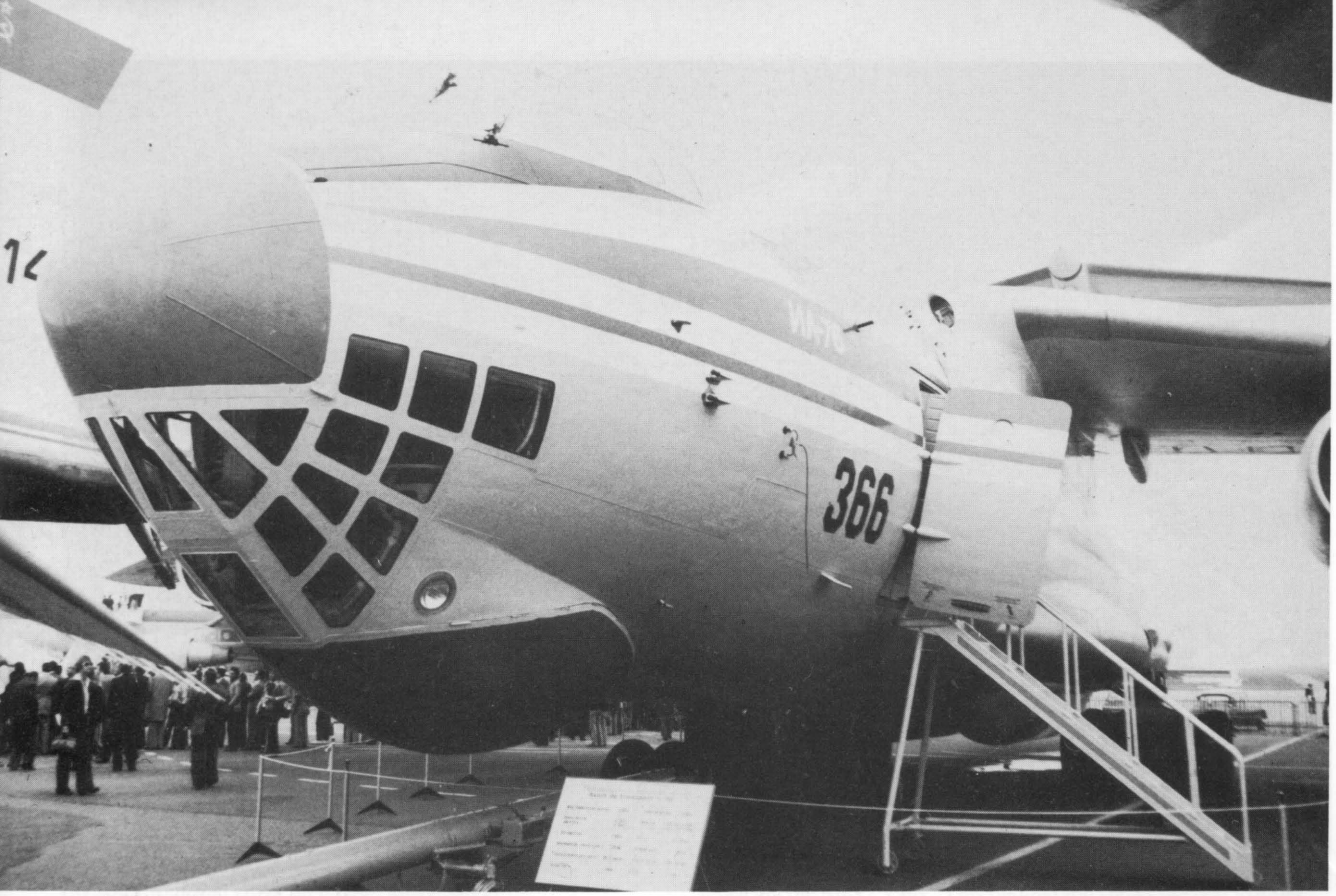

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20. A close-up of the nose of the Il-76 'Candid' shows the navigator's glazed position with radar and avionics sensors mounted above and below. (MJG)

21. The Iluyshin Il-86 'Camber', the first prototype of which is seen here at Le Bourget in 1977, is the first Soviet wide-bodied transport. Although not ostensibly a military aircraft, it obviously has a military transport capability with a 350-passenger capacity. (MJG)

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22. The Kamov Ka-25 'Hormone-A' was the standard Soviet shipborne ASW helicopter until the arrival of the Ka-27 'Helix'. This view shows a 'Hormone-A' about to land on a 'Kresta-II' Class cruiser in 1983. Note the nose mounted-radar and the external fuel tank on the port side of the aircraft, which enables the 'Hormone-A' to be flown to a range of 350nm. (TASS)

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23. Although the 'Hormone' has been mostly replaced by the 'Helix' in the Soviet Naval Air Forces, the Kamov Ka-25 'Hormone-B' is still seen, being identified by its deeper, more spherical undernose radome. It is used to provide over-the-horizon target acquisition and mid-course guidance for such missiles as the SS-N-3 'Shaddock' and SS-N-19. Note the rope netting across the deck of the 'Kresta-II' cruiser, used to secure a non-slip surface for the wheels and the deck crew. (TASS)

24. Obviously derived from the 'Hormone', the Kamov Ka-27 'Helix-A' has now replaced the earlier helicopter in Soviet naval service. First revealed in 1981 in the US publication *Soviet Military Power,* these helicopters were first deployed on the *Udaloy* Class frigates and *Sovremenny* guided missile destroyers. Powered by a pair of Isotov TV3-117V turboshafts, rated at 2,225shp, the 'Helix' can carry homing torpedoes and other stores in a ventral weapons bay (US DoD)

25. A pair of Ka-27 'Helix-A' ASW helicopters seen on the deck of the *Kiev* Class aircraft carrier *Novorossiysk* during its maiden deployment in 1983. (MoD-Navy)

26. As the 'Hormone' spawned a search-and-rescue (SAR) version, so, too, does the Ka-27, in the form of the 'Helix-C' variant. This shows one such helicopter, early in 1987, operating from the KGB-manned, 'Krivak-III' Class frigate *Menzhinsky*, a guard-ship of the Pacific Fleet. (TASS)

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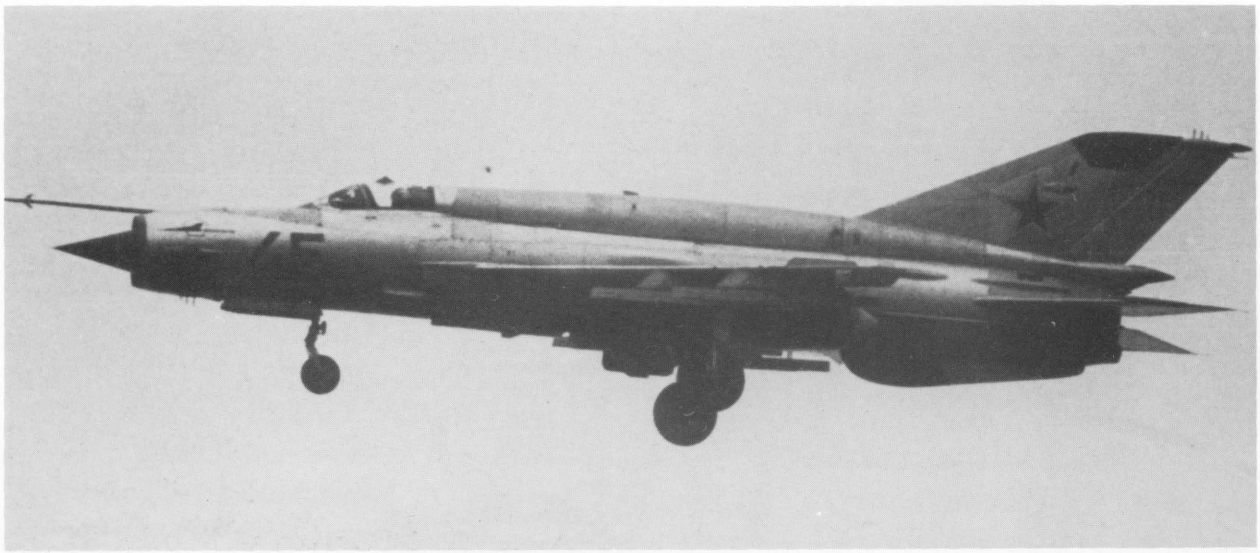

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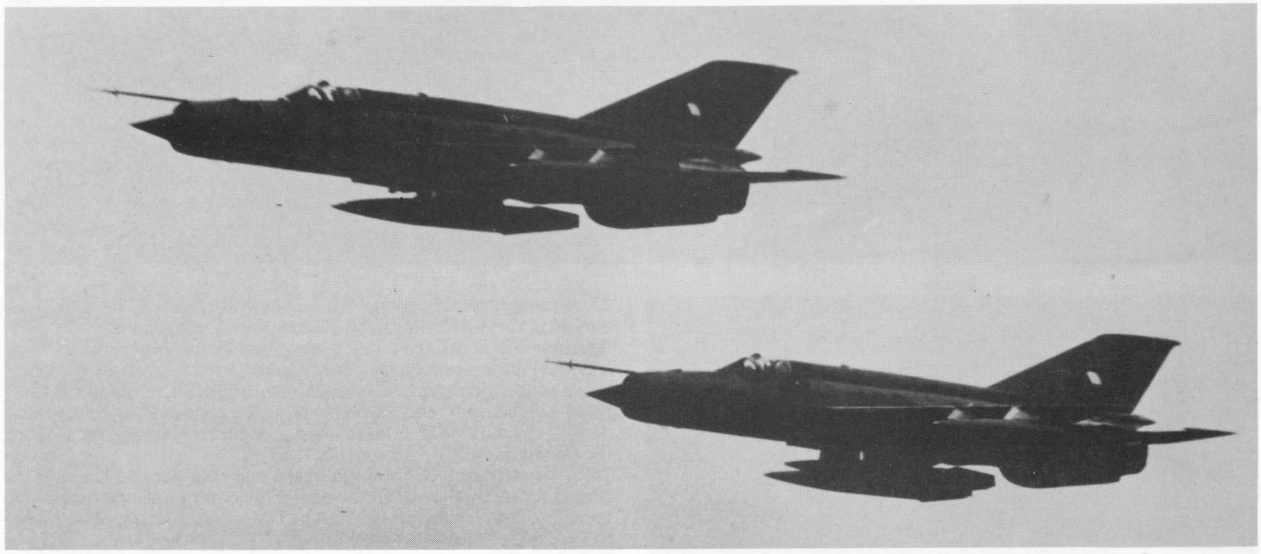

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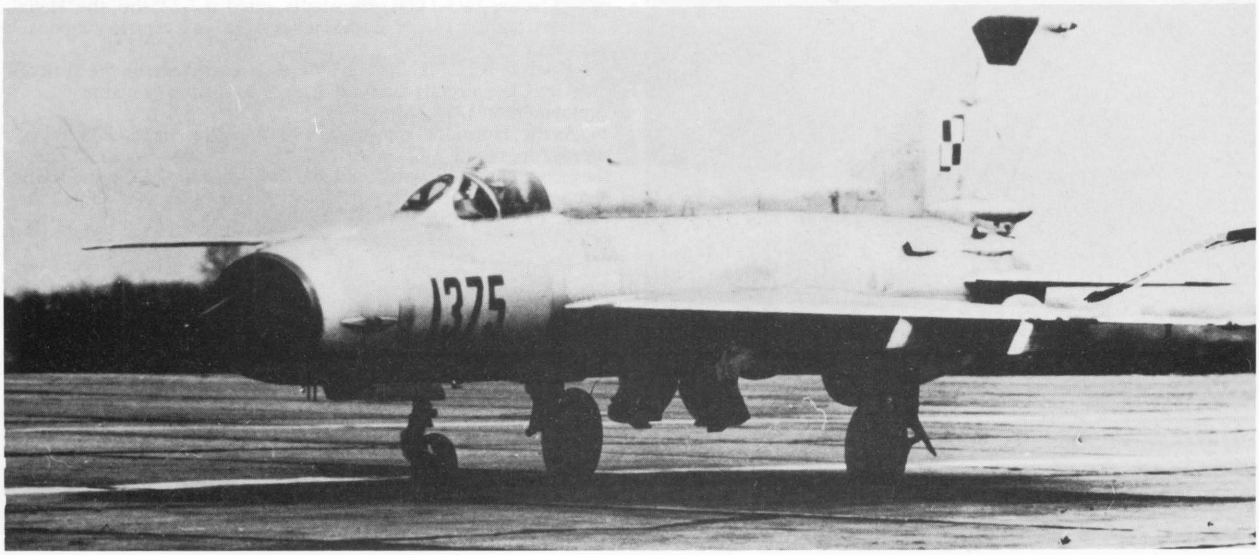

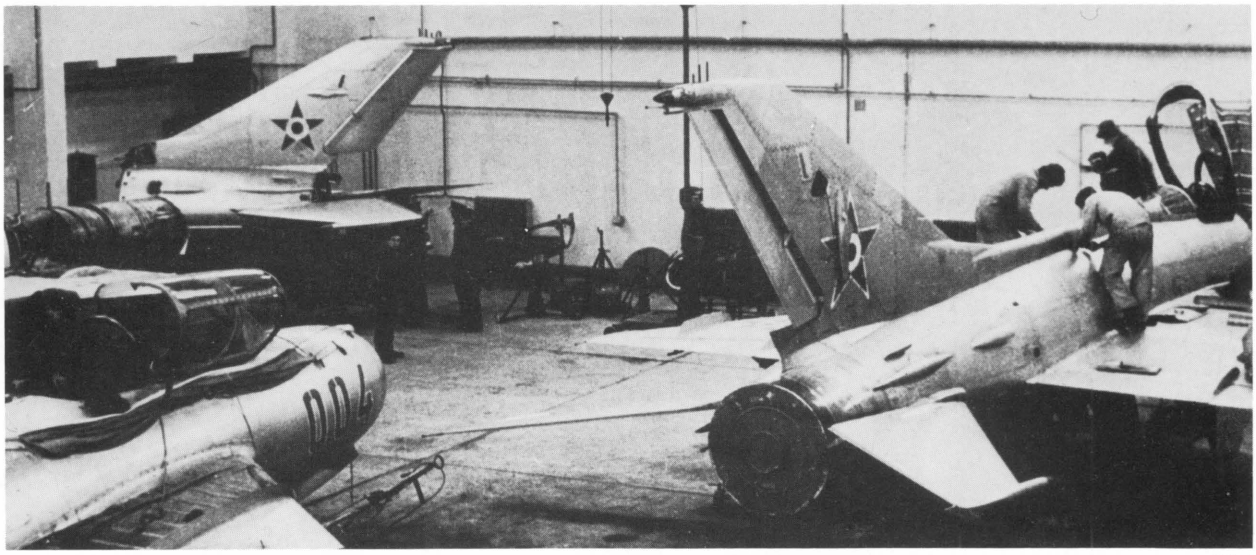

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27. The Mikoyan-Gurevich design bureau has always been associated with fighter design, the best known being the MiG-21 'Fishbed' series. Still in service with 37 air forces around the world, the 'Fishbed' has been through three major generations of development. This photograph shows the MiG-21SMB 'Fishbed-K' with the higher-rated Tumansky R-13-300 turbojet and the deep dorsal spine extended aft to the brake parachute housing to provide optimum aerodynamic form with maximum fuel tankage. There is provision for ECM equipment in small, removable, wing-tip pods, and the aircraft can be armed with both K-13 (AA-2 'Atoll') and AA-2-2 'Advanced Atoll' air-to-air missiles. (US DoD)

28. Deliveries of the MiG-21bis 'Fishbed-L' to Warsaw Pact air forces began in 1971; this version features the Tumansky R-25 turbojet, rated at 16,535lb s.t., and is in service with the Czechoslovak Air Force. The photograph shows the aircraft with three external fuel tanks, one on the centreline station and one on each outboard wing station.

29. The bulk of 'Fishbeds' in Polish Air Force service are MiG-21MF 'Fishbed-J' versions. Basically similar to the earlier MiG-21PFMA 'Fishbed-J' multi-role version, it has a higher-rated Tumansky R-13-300 turbojet engine and five stores stations. The small fairing on the nose, forward of the 'buzz number', is an angle of attack indicator.

30. This hangar view shows two Romanian MiG-21F 'Fishbed-Cs' (right, and left background), the first major production variant of the genre and now somewhat long in the tooth. They are armed with a single NK-30 30mm cannon and a pair of K-13 'Atoll' missiles.

31. The two-seat version of the late-mark 'Fishbeds', the MiG-21UM 'Mongol', is identified by the angle of attack sensor on the port nose and the extended-chord fin. As can be seen by the empty missile launch rail under the wing of this Czech aircraft, it retains a combat capability. It is powered by the R-13-300 turbojet.

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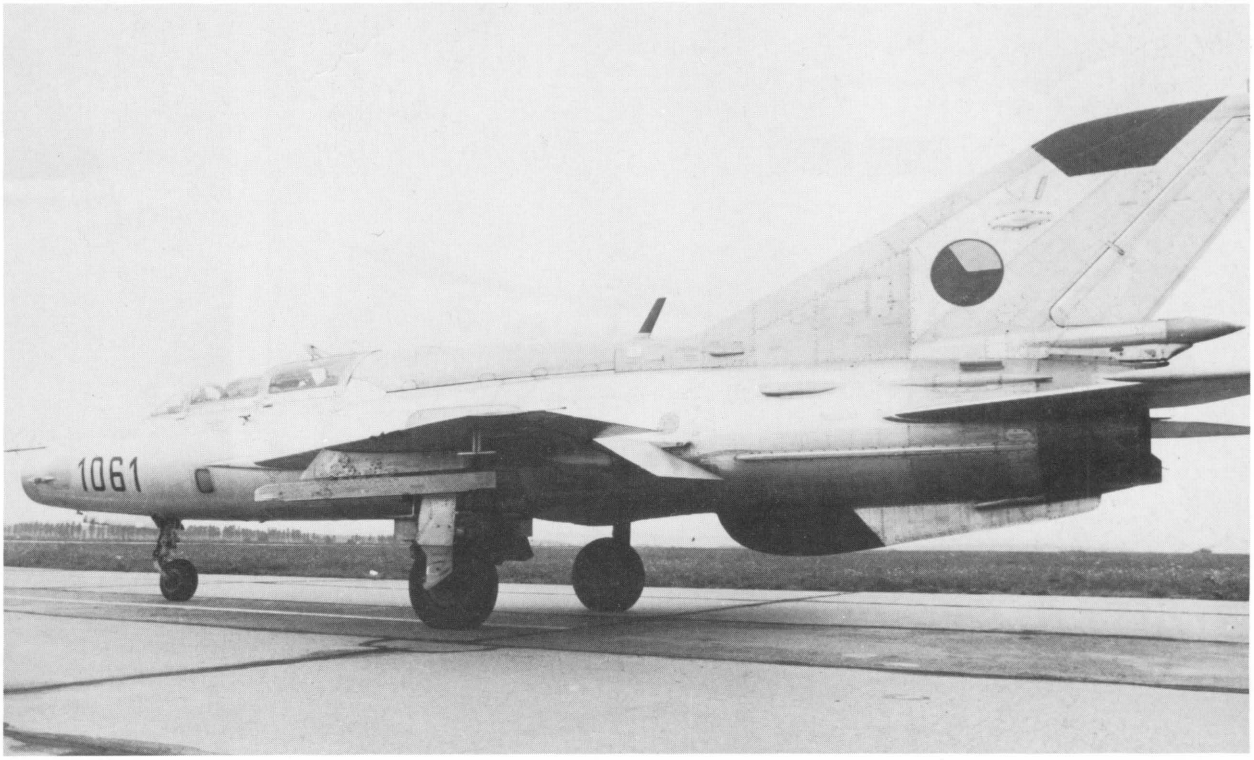

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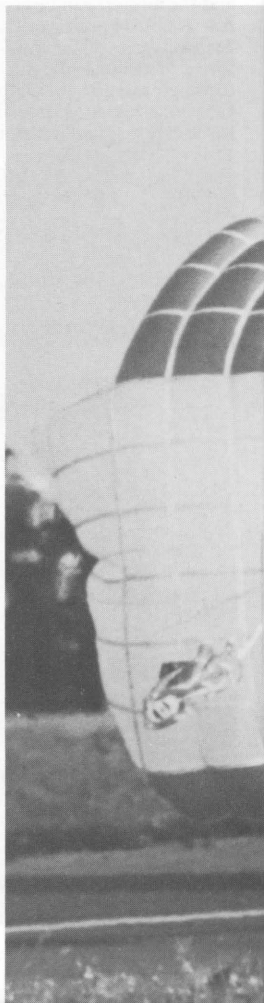

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32. First identified in 1967, the MiG-23 is the first operstional variable-geometry fighter in Soviet service. This photo shows a MiG-23 'Flogger-G', one of the aircraft which made a goodwill visit to Rheims in France (and also Finland) in 1978. Basically similar to the MiG-23MF 'Flogger-B', it has a smaller dorsal fin and, apparently, no provision for weapons pylons. This was a specific modification, to enhance aerobatic performance for these Kubinka-based aircraft. (SIRPA)
33. Another view of one of the Kubinka 'Flogger-Gs' at Rheims in plan view, showing the forward position of the wings and complete absence of wing pylons, although a centreline pylon (probably for an external fuel tank for ferry purposes) and the single 23mm GSh-23L cannon pack are visible. (SIRPA)
34. The 'Flogger-G' has since been confirmed as an operational variant of the MiG-23MF, equipped with a lighter-weight radar and armed with AA-7 'Apex' and AA-8 'Aphid' air-to-air missiles. (US DoD)
35. This shot of a MiG-23 at Rheims shows an aircraft taxiing in to the flight line with its brake parachute deployed. (SIRPA)

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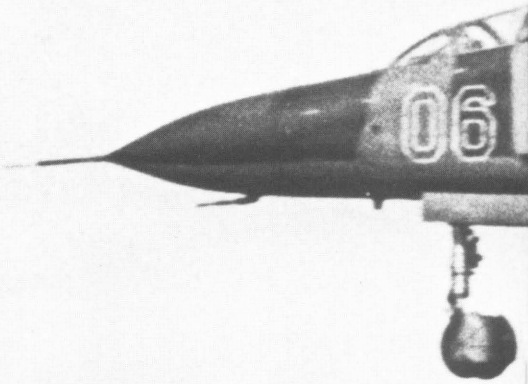
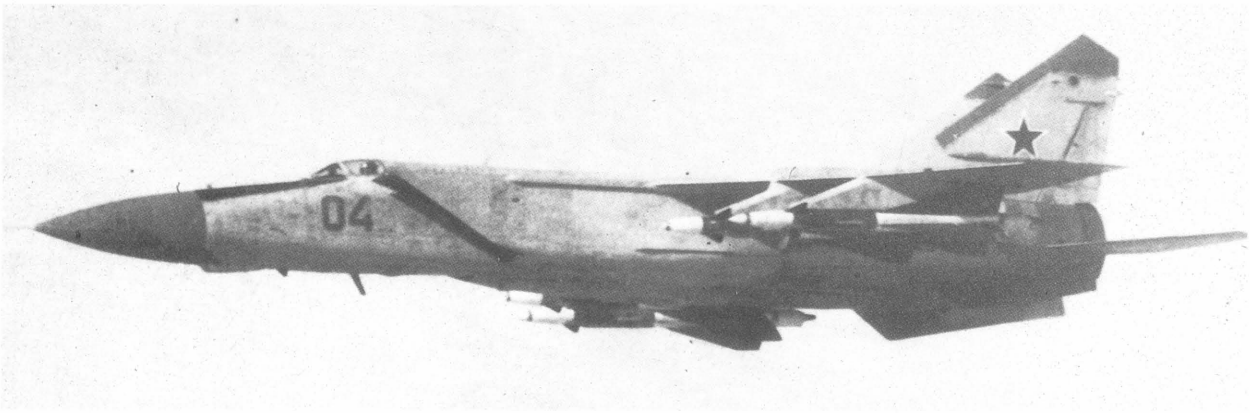


36. This 1985 photograph shows the 'Flogger-H' version of the MiG-23BN, equipped with the smaller 'Jay Bird' radar but without an under-nose infra-red sensor. This particular Soviet aircraft is, according to the original caption, assigned to the Byelorussian Military District. The MiG-23BN has been exported to other Warsaw Pact countries and the Indian Air Force. (TASS)

37. This pair of MiG-23UM 'Flogger-C' trainers represents the standard two-seat operational conversion. The second cockpit is slightly raised and is fitted with a retractable periscope sight, while the dorsal fairing is of an increased depth to match the rear cockpit. The MiG-23UM has full combat capability. (TASS)



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38. Originally thought to be designated MiG-23, the MiG-25 'Foxbat' fighter was designed as a counter to the US XB-70 Valkyrie bomber. This photo shows the MiG-25M 'Foxbat-E' version, modified from the 'Foxbat-A' to incorporate a radar with a limited look-down/shoot-down capability. This aircraft is armed with AA-6 'Acrid' missiles. (US DoD)

39. This recent photograph shows a MiG-25M 'Foxbat-E' armed with AA-6 'Acrid' air-to-air missiles. Some 300 'Foxbats' are estimated to be in service with the home defence interceptor force, while another 130 interceptors and some 170 MiG-25R 'Foxbat-B' reconnaissance aircraft serve with the Soviet tactical air forces. (TASS)

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40. The Antonov An-74 seen at Le Bourget in June 1987 is derived from the An-72 'Coaler' transport, very similar to the Boeing YC-14 Advanced Medium STOL Transport of the mid-1970s. It is understood to be designed for transport duties in remote, snow-covered areas (i.e. Arctic or Antarctic regions). (MJG)

41. Another US transport 'looklike' (similar to the Lockheed C-5 Galaxy) is the Antonov An-124 Ruslan (NATO code-name 'Condor') seen here flying at Le Bourget in 1985. The ten-bogie mainwheel undercarriage is clearly visible. (US DoD)

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42. This artist's impression shows the Iluyshin Il-76 which has been developed as the platform for the Soviet AEW system to replace the earlier Tu-126 'Moss'. This version is codenamed 'Mainstay' and features a rotating radome mounted above the fuselage, similar to the US E-2 and E-3 AWACS aircraft. Production is currently estimated by the US DoD at five per year. (DoD)

43. The advent of armed helicopters and then dedicated gunships has led, finally, to the development of the dedicated anti-helicopter helicopter. The Soviet Union has been the first nation to produce such an aircraft in the form of the 'Hokum'. Its unique contra-rotating rotor configuration identifies it as a product of the Kamov design bureau, but as yet no designation is known. A crude side-view drawing first appeared in the 1986 edition of *Soviet Military Power*, and this artist's impression comes from the 1987 edition. It follows the now standard tandem cockpit configuration, is armed with a nose cannon (assumed to be of 30mm calibre) and has rockets and missiles on the stub wings. The new Mi-28 'Havoc' attack helicopter can be seen in the lower right of the picture. (US DoD)

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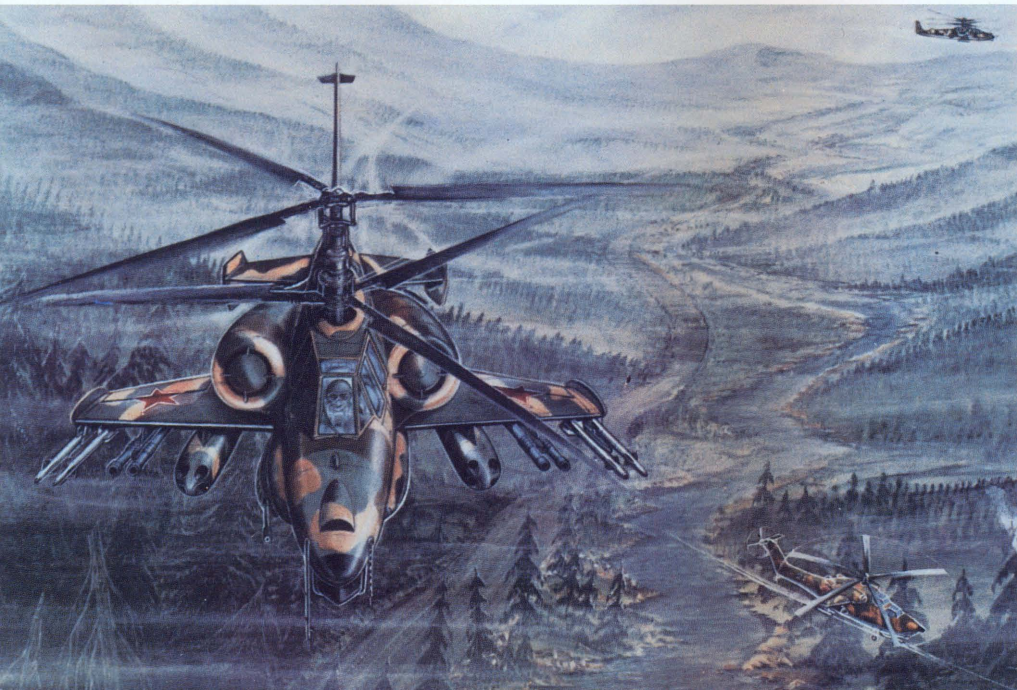

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44. This artist's impression shows a pair of Mil Mi-24 'Hind-D' gunships using chemical warfare spray equipment. (US DoD)
45. A number of MiG-23 'Flogger-Gs' of the Eastern German (DDR) air force. Similar to the MiG-23MF 'Flogger-B', although with a smaller dorsal fin, and the 'Flogger-Gs' which visited Sweden in 1981, this variant has become standard equipment in the Soviet Air Forces and has also been exported to Syria.

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46. The latest Soviet air combat fighter is the MiG-29 'Fulcrum-A', seen here over the Baltic Sea, with two AA-10 'Alamo' medium-range AAMs and four AA-11 'Archer' dogfight AAMs. (*Flygvapnet*)
47. Derived from the MiG-25 'Foxbat', the MiG-31 'Foxhound' is a two-seat, long-range interceptor with a look-down/shoot-down radar capability. The second cockpit can be seen in this photograph. The air intakes have been enlarged, and leading-edge root extensions have been fitted. (RNorAF via US DoD)
48. A Tupolev Tu-16 'Badger-C Mod' anti-shipping aircraft seen here with the underwing pylons needed to carry anti-ship missiles such as the AS-4 'Kitchen' or AS-6 'Kingfish'. (US DoD)
49. Pilots of the national air defence force with a line-up of 'Foxbats'. The two-seat MiG-25U 'Foxbat-C' dual cockpit is clearly visible. The second cockpit replaces the nose radar and sensors, so the aircraft is not considered combat-capable. (TASS)
50. Derived from the MiG-23, the MiG-27 shares the NATO code-name of 'Flogger', being basically the same aircraft but configured for the ground attack role. The main difference is in the shape of the nose, which does not have a radar installed: in its place is a laser ranger and marked target seeker system. This photograph shows a 'Flogger-D' of the Czech Air Force deploying its brake parachute on landing.

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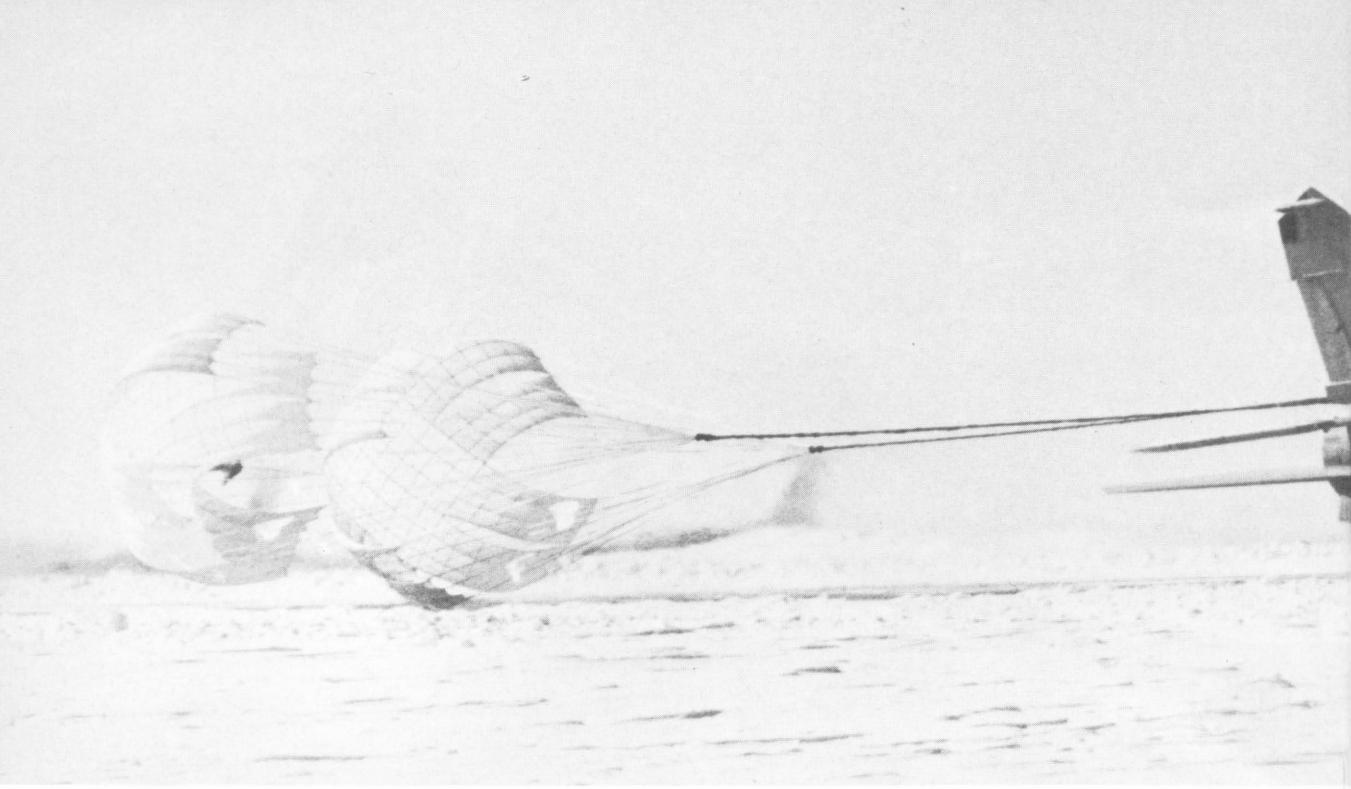

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51. Another view of the MiG-25U 'Foxbat-C' trainer shows it landing on a snow-bound airfield using a brake parachute, which would also be used on austere airfields to reduce the landing run. (TASS)

52. The MiG-27 'Flogger-D' has laser equipment in the nose and is fitted with seven stores pylons. Its combat radius is about 210nm. This is a Czech aircraft.

53. This view of another Czech MiG-27 apparently shows the pilot on change-over prior to a second mission. The pilot on the steps has NBC equipment strung over his shoulder in bags, as does the ground crewman to the right. The simple, robust nature of the aircraft's main undercarriage members is visible in this photograph, as are some sort of anti-FOD (foreign object damage) screen on the side intakes to the engine and the ground power cable immediately below. This aircraft also lacks the bullet-shaped antenna on the wing gloves.

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54. A goodwill visit to Kuopio-Rissala air base in Finland by six MiG-29 'Fulcrums' in July 1986 gave the Western world its first chance to see the latest Soviet air combat fighter. This photograph shows the aircraft's large twin fins with the intake doors blanked off. Just visible ahead of the windscreen of the aircraft is the infra-red 'ball' of a long-range visual detection system installed in recent Soviet fighters. (Kalle Kultala)
55. Another view from Finland clearly shows the five louvre-type intakes on the MiG-29's wing surface as it blends into the fuselage, above the air intakes. Immediately on landing the main intakes blank off and the louvres open. This is to ensure that the intakes do not ingest any loose material (FOD) which might damage the engine fans. (Kalle Kultala)
56. This view of a Soviet MiG-27 'Flogger-D' shows the aircraft with gun pods mounted on the fixed, inboard pylons. The barrels of these guns can be depressed for ground attack. Note the small weapons pylons on the lower rear fuselage, just forward of the air brake.

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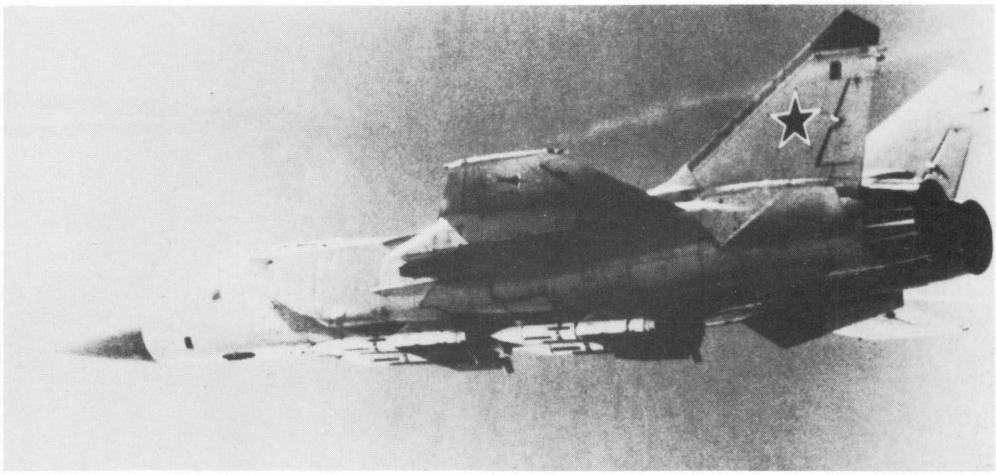
57. Five of the six MiG-29 'Fulcrums' which visited Finland, seen in the air. The sharp leading-edge root extensions and the twin-tunnel arrangement of the engine are clearly visible. The large ogival nose radome houses a radar with look-down/shoot-down capabilities. (Via US DoD)
58. This rather hazy air-to-air shot of the MiG-29 'Fulcrum' shows the aircraft with a pair of R-60 (AA-8 'Aphids') and a single AA-10 'Alamo' under each wing. The 'Fulcrum's main armament is completed by a 30mm Gatling-type gun in the port wing leading edge. (Via US DoD)
59. This view of the MiG-31 'Foxhound' shows four radar-homing AA-9 'Amos' air-to-air missiles under the fuselage. These have a range of 21–24nm, according to DoD estimates. There is also provision for two smaller AA-8 'Aphids' under each wing. (RNorAF via US DoD)
60, 61. Still in operational service as a heavy, general-purpose helicopter, the Mil Mi-6 'Hook' could now well be on its way out of front-line service in favour of the Mi-26 'Halo'. In its normal assault role it can carry 70 fully equipped troops; alternatively, it can carry up to 12,000kg of payload inside (including light armoured vechicles), or 8,000kg as an underslung load



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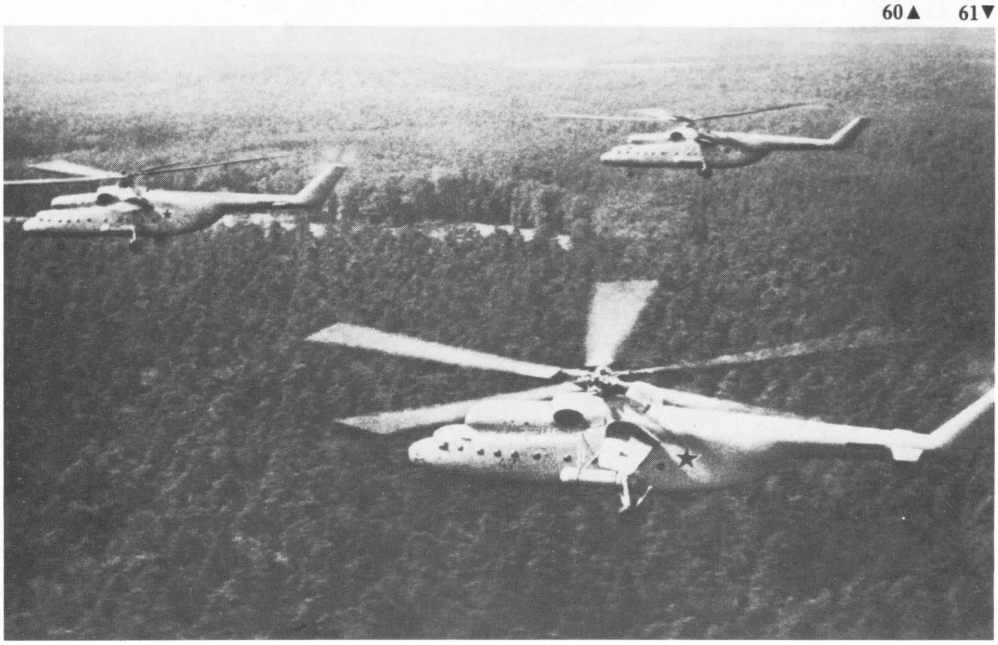

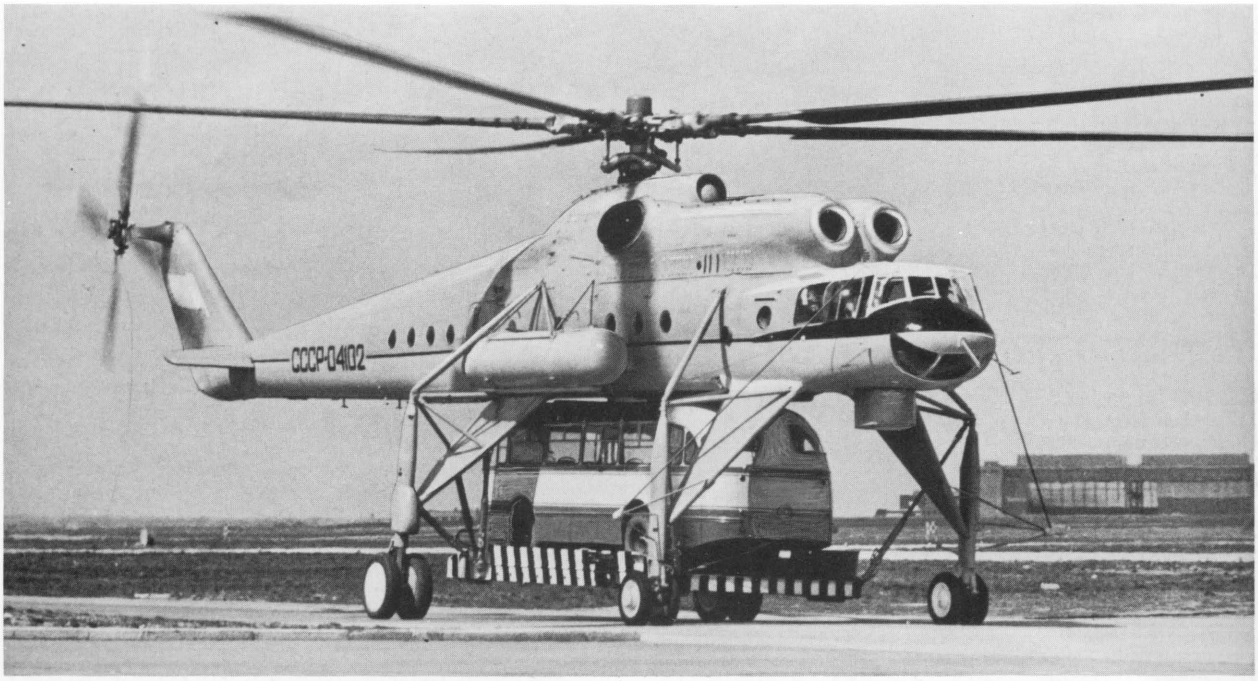

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62. The concept of the 'flying crane' was a popular role for large helicopters in the 1960s. Taking the Mi-6 as a starting point, Mil developed the Mi-10 'Harke', which is capable of carrying an underslung payload of up to 33,865lb when fitted with Soloviev D-25VF turboshaft engines uprated to 6,500shp. A prototype machine is illustrated, and the production Mi-10K has a shorter undercarriage. (TASS)

63. Derived from the Mi-8 'Hip', the Mil Mi-14 'Haze-A' has a boat-type hull for its undersurface. First flown in 1973, it has replaced the Mi-4 'Hound' in the Soviet Naval Air Force ASW fleet. This photograph clearly shows the underfuselage weapons bay and nose-mounted radar. The cable streamed aft is a towed magnetic anomaly detection (MAD) sensor.

64. As widely used as the American UH-1 series, the Mil Mi-8 'Hip' is a larger helicopter, more akin to the Sea King in size. The basic passenger version can carry between 28 and 32 people and, as this Hungarian 'Hip-C' shows, features rear clamshell doors. (Via P. Beaver)

65. The Mi-8 'Hip-E' has been described as one of the most heavily armed of Soviet helicopters. In this photograph braced stub wings at the rear of the fuselage can be seen with three pylons attached, and, although not shown here, a further two pylons can be fitted above the wing for anti-armour missiles. A nose-mounted 12.7mm machine gun (just visible) completes the armament. This photograph shows Soviet KGB Border Guards, including a tracker dog, racing to the helicopter to react to an 'alert'. (TASS)

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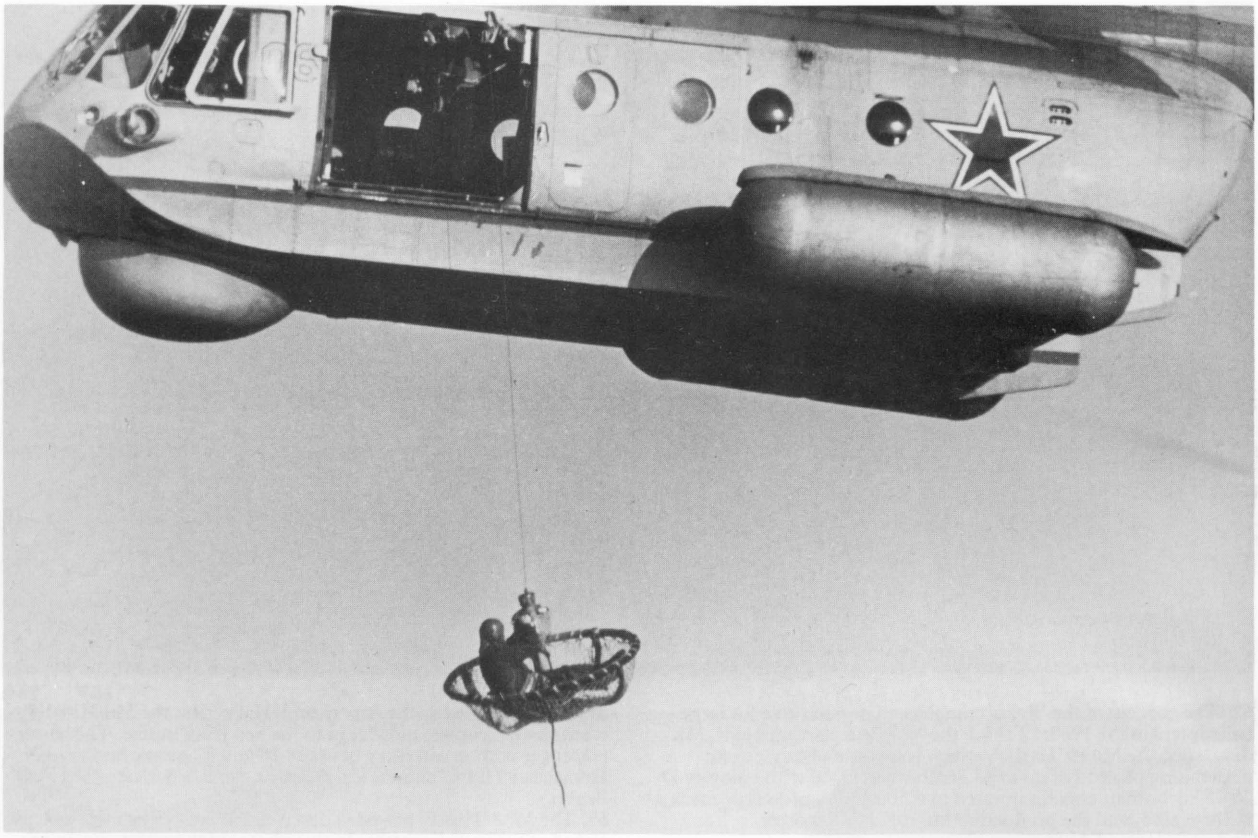

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66. This view of an Mi-14 'Haze-A' shows the helicopter in its secondary role of SAR, winching up a 'survivor' in a Soviet version of the Sproule net. The photograph also clearly shows the inflatable outrigger sponsons on the rear fuselage. The Soviet Navy was reported to have some 100 'Hazes' in service in 1986. (TASS)

67. Four Mil Mi-24 'Hind-Ds' over the open steppes of White Russia and the Caucasus. This might be described as 'typical Hind country', where the open assault is preferred to ambush over wooded, hilly areas. This missile assault against ground forces was part of Exercise 'Caucasus 85'. (TASS)

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68. Although the amateur folk group in the foreground is the official subject of this photograph, taken during Exercise 'Caucasus 85', it is the Mi-6 'Hooks' and Mi-24 'Hind-Ds' in the background which are of more interest in this context. The 'Hooks' provide a support function for the 'Hinds' of the army aviation unit. (TASS)
69. Basically similar to the 'Hind-E', the Mi-24 'Hind-F' has the nose-mounted gun replaced by a twin-barrelled 30mm cannon located on the starboard side of the nose. As a result, the lower portion of the nose now has a smooth fairing. The first photographs of this version were published in 1982. (Via John W. R. Taylor)
70. (Next spread) The Mi-17 'Hip-H' is an improved 'Hip-E' with the tail rotor on the port side of the tailboom and air intake protection baffles. This example, armed with rocket pods, also shows IR suppressors over the engine exhausts and what appears to be an IR jammer immediately aft of the upper fuselage fairing. The troops disembarking are airborne soldiers undergoing what the official caption describes as 'survival training'. (TASS)

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71. This view of the Mil Mi-26 'Halo' was taken on its first appearance at Farnborough in September 1984. The size of the helicopter is apparent from the spectators in the picture. In its military role, it has accommodation for 85 fully equipped troops or, alternatively, it can carry up to 20,000kg of cargo either internally (until it bulks out) or underslung. (MJG)

72. One of the first indications the West received that the Mi-26 'Halo' was getting into military service was this view of a camouflaged machine involved in spraying operations over the burnt-out Chernobyl nuclear reactor. (US DoD)

73. This view of a camouflaged military Mi-26 'Halo' appeared in the Russian publication *Soviet Military Review 4/87* alongside a brief article on the type. According to the information published, the Mi-26 has a take-off weight of 56,000kg, a hovering ceiling of 1,800m, a service ceiling of 4,500m and a flight range of 800km.

74. The revelation in the 1985 edition of *Soviet Military Power* of the 'AH-64 Apache lookalike' – the Mil Mi-28 'Havoc' – has led to an awareness that the Soviet planners are learning the lessons of the West: armed helicopters are now assuming an air-to-air as well as an air-to-ground role, as this artist's impression shows. The 'Havoc' is armed with four laser-guided, anti-armour missiles in special pods on each inboard pylon, while dual launchers on each outer pylon show modified SA-14 air-to-air missiles. The armament is completed by a nose turret housing a heavy-calibre (23mm or 30mm) cannon. According to the DoD, the 'Havoc' entered production in 1986 and has undergone operational testing in Afghanistan. (US DoD)

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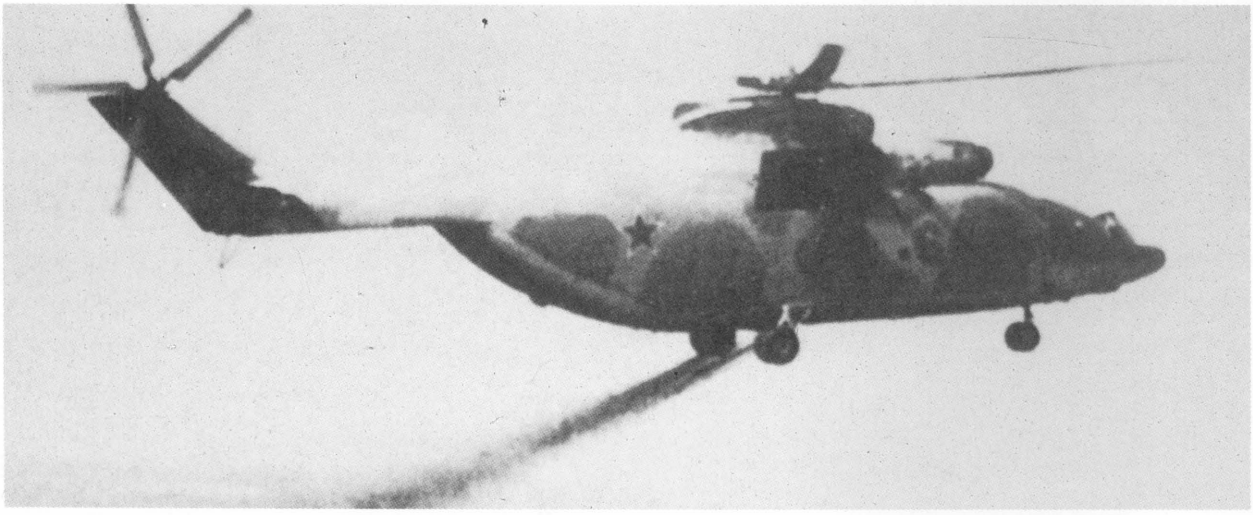

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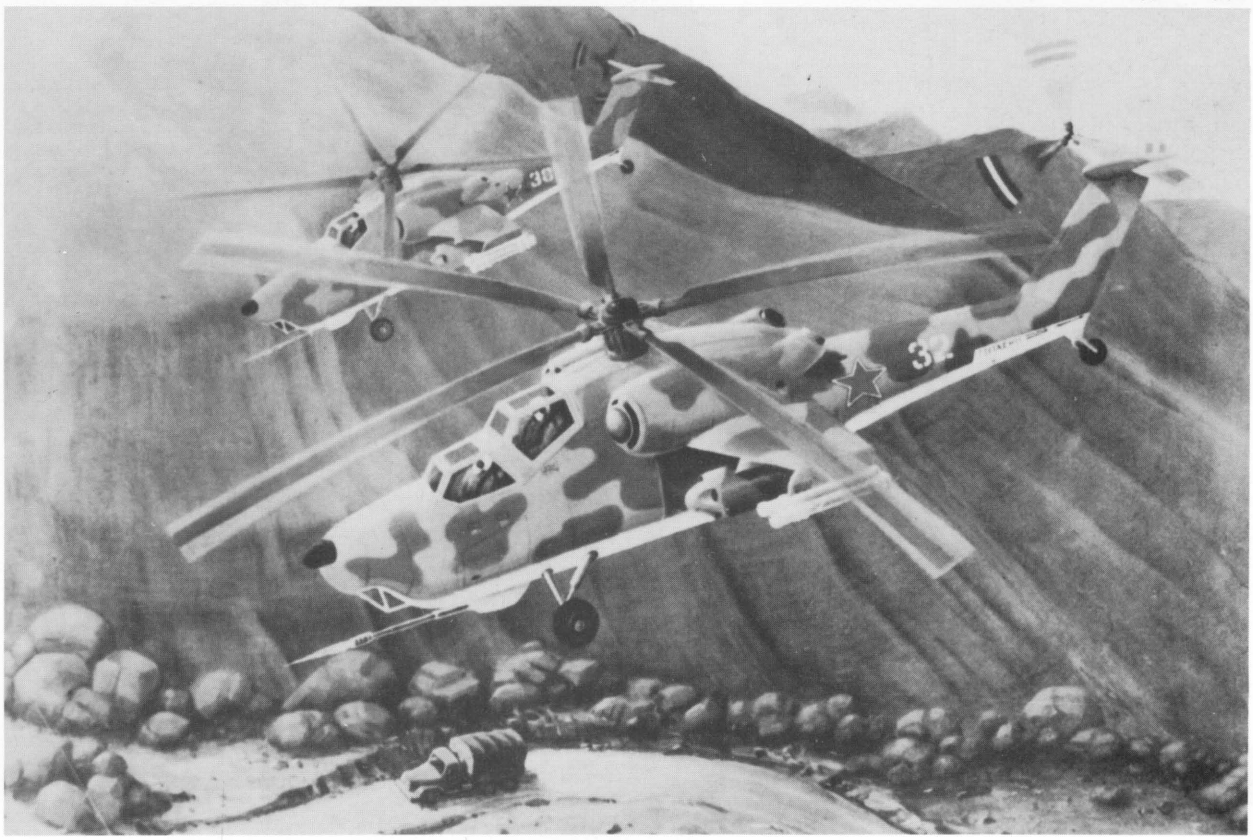

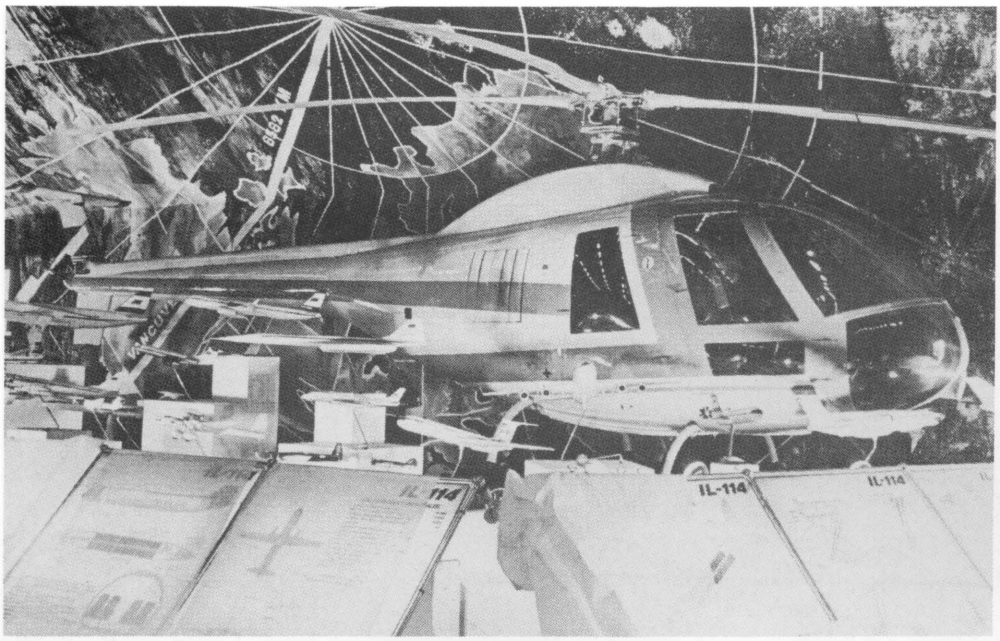

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75. The Mil Mi-34, seen here on display in the Soviet pavilion at Le Bourget in 1987, flew early in 1987 and is scheduled to enter production in 1989. It is described as 'a low-cost, low-fuel-consumption helicopter intended for pilot training, sport flying and diverse civil tasks', but it is a fair assumption that a military variant will be forthcoming. It is powered by a single 325hp Vedeneyev M-14V-26 nine-cylinder, air-cooled, radial engine and has a maximum speed of 113kt.
76. Still found in Soviet service in limited numbers, the Myashishchev M-4 'Bison' is used for maritime reconnaissance and as an in-flight refuelling tanker. A prototype was shown over Moscow in 1954, so longevity is not restricted to Western aircraft. One 'Bison' has been modified to act as a transport for the Soviet space shuttle vehicle, with the conventional fin being replaced with twin endplate fins and rudders of rectangular shape. This photograph shows a 'Bison-B' maritime reconnaissance version.
77. The Tupolev Tu-142 is once more back in production, as the 'Bear-H', equipped to carry the new AS-15 'Kent' air-launched cruise missile. Note the in-flight refuelling probe on the nose, and the chin radome. (US DoD)
78. With production currently running at over 30 per year according to the US publication *Soviet Military Power*, the Tupolev Tu-22M/26 'Backfire' poses a serious threat to NATO air forces. (*Flygvapnet*)

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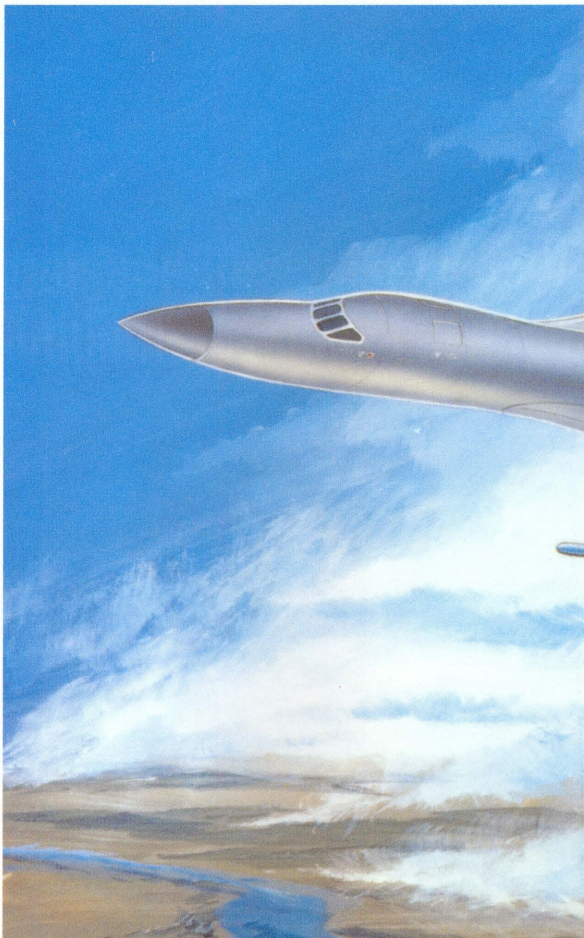
79. The Sukhoi Su-21 'Flagon-F' air defence fighter has gone down in history as the type which shot down KAL Flight 007 in 1983. Having a purely missile armament (AA-3 'Anabs' are seen on this aircraft), the 'Flagon-Fs' which intercepted the airliner were unable to persuade it to land and, thus, were forced to shoot it down.

80. With wings fully spread and undercarriage extended, the two-seat Sukhoi Su-24 'Fencer-C' bears an uncanny resemblance to the US F-111 strike fighter. (US DoD)

81. The latest bomber from the Tupolev stable (and one for which a designation has not yet been released), the 'Blackjack' bears a marked similarity to the B-1B. It is, however, according to US sources, some 13 per cent larger and is thought to be the long-expected successor to the 'Bison' and 'Bear-A' bombers. This artist's impression shows the 'Blackjack' launching an AS-15 'Kent' cruise missile. (US DoD)



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82. Still the only operational Soviet VTOL fighter, the Yakovlev 'Forger' is now known to carry the designation Yak-38, although it has previously been known as the Yak-36MP. Two of these aircraft (on the left) can be seen carrying R-60 (AA-8 'Aphid') air-to-air missiles. (Via US DoD)

83. A joint venture between SOKO of Yugoslavia and CNIAR of Romania, this single-seat strike fighter is known as the J-22 Orao (Eagle) by the former and as the IAR-93 by the latter. The aircraft is powered by a pair of licence-built Rolls-Royce Viper Mk.633-41 turbojets, each rated at 4,000lb s.t. The uprated-capability Orao 2 (illustrated) made its first flight in 1983, although the original IAR-93 had flown in 1974.

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84. Within the Warsaw Pact, the Sukhoi Su-7B 'Fitter-A' remains in service with the Czech and Polish air forces. These aircraft are Czech and are shown carrying external fuel tanks which help make up for the aircraft's lack of internal tankage but reduce its warload capability.

85. The Sukhoi Su-17 'Fitter-Cs' depicted here represent the basic single-seat attack aircraft of the Soviet tactical air forces. A variable-geometry development of the Su-7B with manual wing-sweep control, it is powered by a Lyulka AL-21F-3 turbojet rated at 17,200lb s.t. This photograph shows a group of pilots preparing for the day's flying during Exercise 'Caucasus 85'. (TASS)

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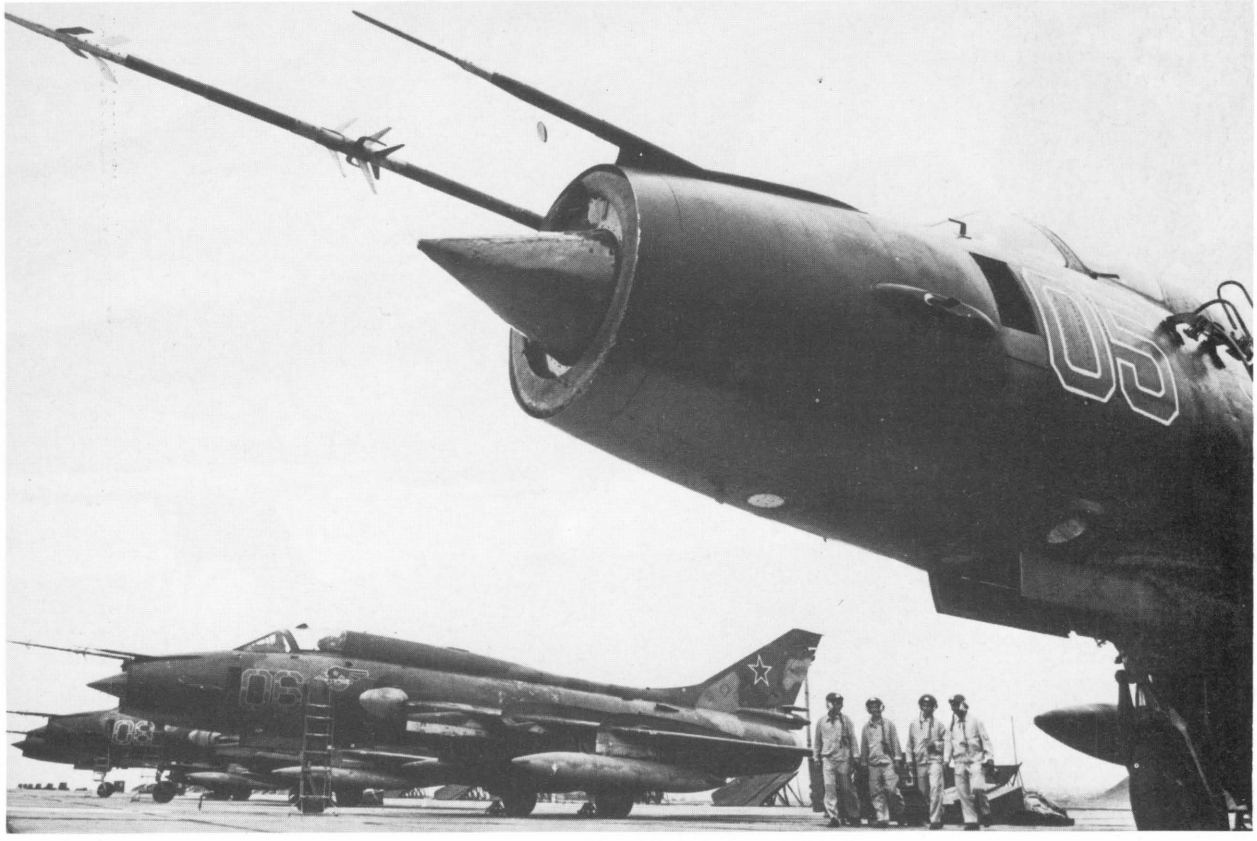

86. This rear view of an Su-17 'Fitter-C' clearly shows the twin air scoops on the rear fuselage which identify the Lyulka-powered versions; some export models, designated Su-20 and Su-22, are powered by the Tumansky R-29BS-300 turbojet, resulting in bulged rear fuselage and single scoops. The 'Fitter' series of attack aircraft have eight weapons pylons, the two fuselage stations being visible on this photograph. (TASS)

87. The Sukhoi Su-21 'Flagon-F' is the last known production model of the Su-15 series. It has a greater wing span than earlier 'Flagon-A' models, with compound sweep, and is powered by two uprated Tumansky R-13F2-300 turbojets, of 15,875lb s.t. It also has an ogival-shaped nosecone, whereas the 'Flagon-E' has a conical cone. Some 500-plus 'Flagon' models (E/F/G) are estimated to remain in service. (TASS)

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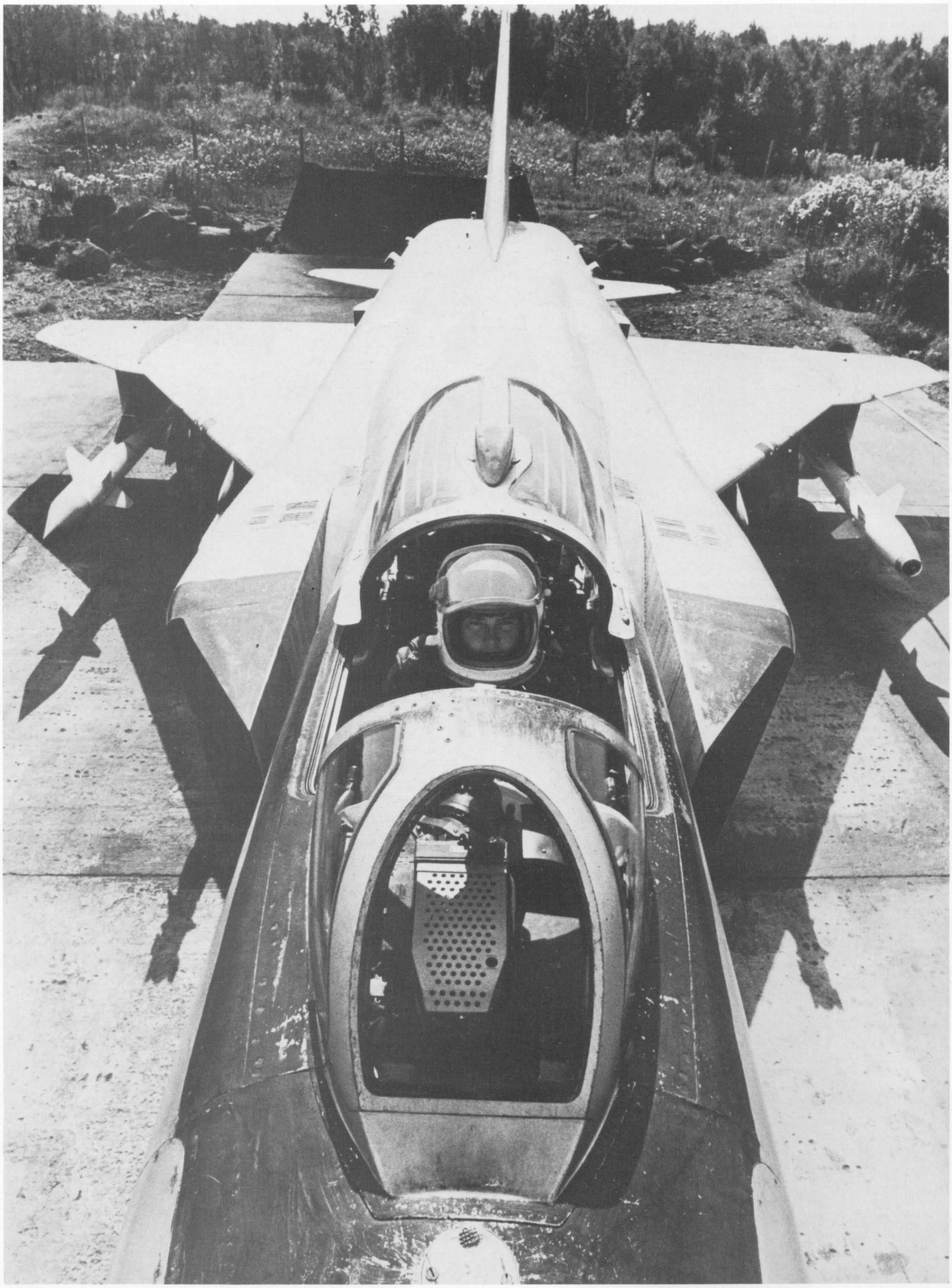

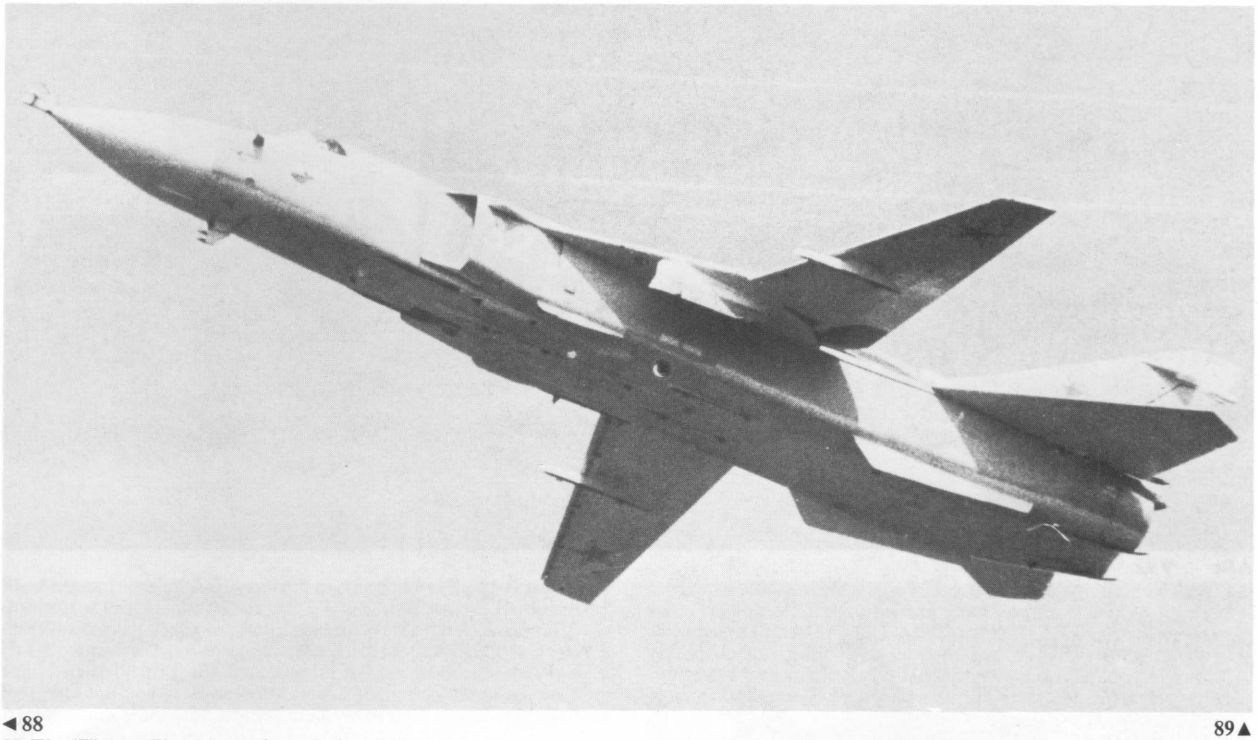

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88. The 'Flagon-F's claim to fame (infamy?) is that it was responsible for shooting down the KAL Boeing 747. This unusual view of a 'Flagon-F' clearly shows its main air-to-air missile armament of AA-3 'Anabs', the radar-guided version on the left of the picture and the infra-red (IR) guided version on the right. It can also carry a pair of AA-8 'Aphid' short-range AAMs. Looking through the windscreen, the cathode-ray tube display screen of the 'Twin Scan' X-band radar is visible. (TASS)

89. Very similar in layout and configuration to the US F-111 Sukhoi's Su-24 'Fencer-C' is, however, smaller and lighter. This version of the variable-geometry Su-24 entered service in 1981 and has an estimated combat radius of action (hi-lo-hi, with two external tanks and 6,615Ib of weapons) of 700nm. (US DoD)

90. This view of an Su-24 'Fencer-C' was taken over the Baltic Sea by the Swedish Air Force and released in January 1985. It is carrying two external fuel tanks and two other underwing pylons, although it is credited with eight pylons capable of lifting a total of 24,250lb of stores. A single, six-barrelled 30mm Gatling-type cannon is mounted on the starboard side of the lower fuselage. (*Flygvapnet*)

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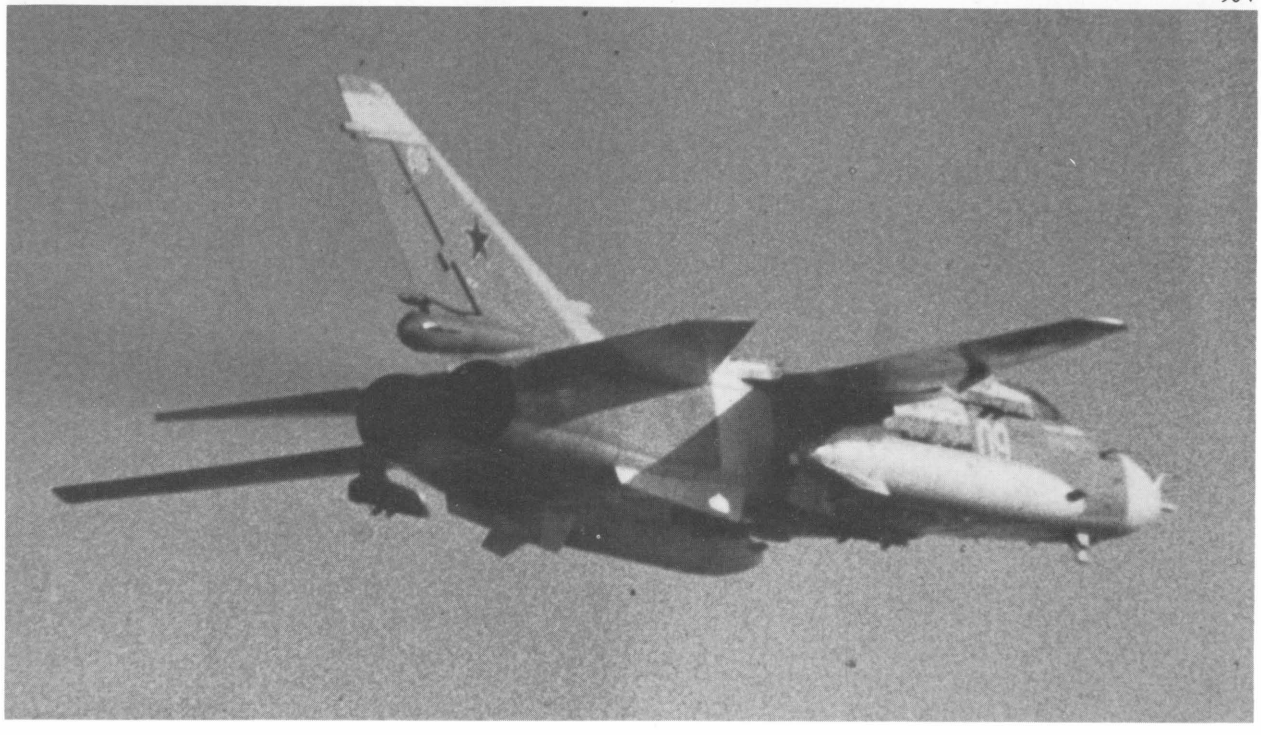

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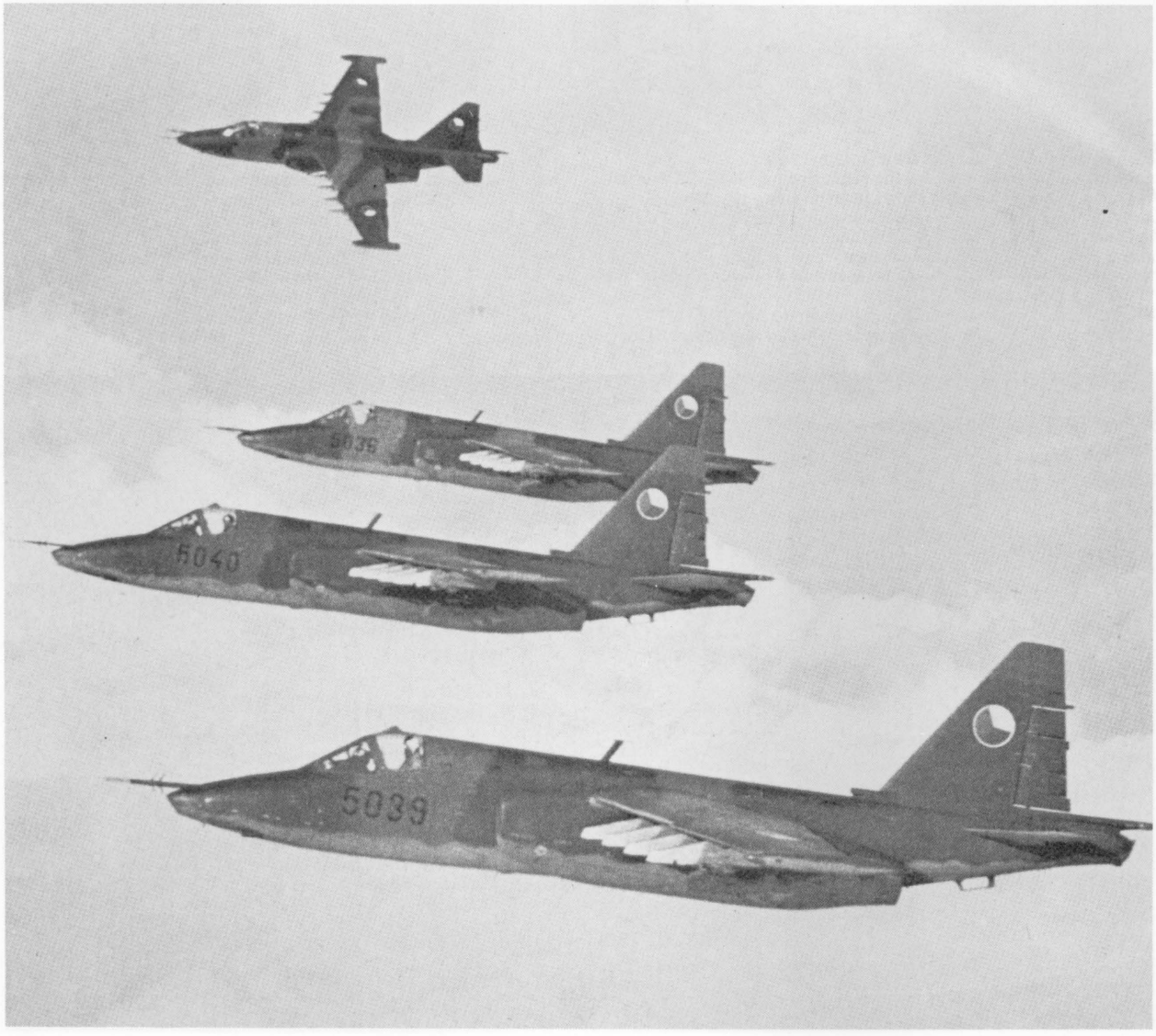

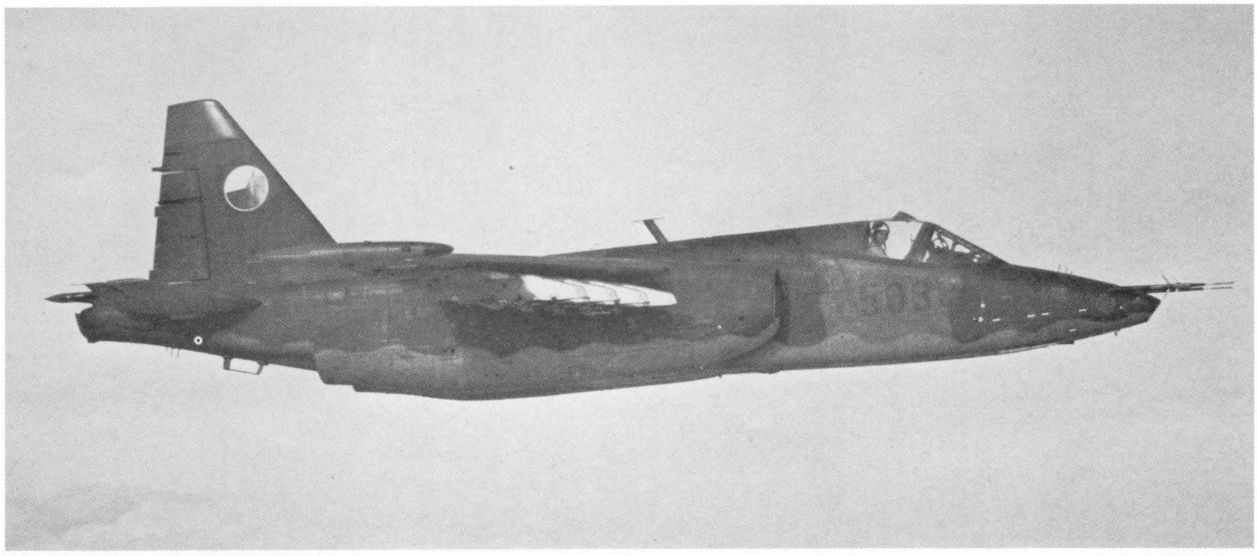

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91. Although it is an A-10 equivalent, the Sukhoi Su-25 'Frogfoot' does not at first glance follow the 'US lookalike' trend. However, if one thinks back to the original competition for the A-X aircraft (from which the A-10 emerged), the 'Frogfoot' does bear a similarity to Northrop's unsuccessful A-9 contender. Some of the first photographs of 'Frogfoot' came from film shot over Afghanistan, where the aircraft underwent operational testing. This photo shows Czech Su-25s.

92. The first clear photographs of the Su-25 'Frogfoot' were published in the Czechoslovak magazine *Letectvi + Kosmonautika* in September 1985. This formation shot of four Czech 'Frogfoots' (should that be Frogfeet?) shows the basically simple layout of the aircraft. (*L+K*)

93. This close-up side view of the Su-25 'Frogfoot', again from *Letectvi + Kosmonautika*, shows the four main pylons under the wing, capable of carrying an estimated 9,920lb of weapons, as well as a smaller pylon for AA-2 'Atoll' or AA-8 'Aphid' AAMs, just visible inboard of the wing-tip pod. The 'Frogfoot's arsenal is completed by a single twin-barrelled 30mm cannon on the port side of the nose. Some 75 Su-25s were estimated to be in Soviet service early in 1986, plus the one Czech squadron. (Vaclav Jukl/*L+K*)

94. Not unlike the F-15 Eagle, Sukhoi's Su-27 'Flanker' is the latest Soviet air superiority fighter. A supersonic, all-weather aircraft, 'Flanker' is equipped with the latest Soviet look-down/shoot-down radar fire control system with beyond-visual-range (BVR) missiles. This photograph, one of the first released, shows a prototype aircraft, identified by the curved wing tips and lack of an extended tail cone between the engine exhausts. (US DoD)

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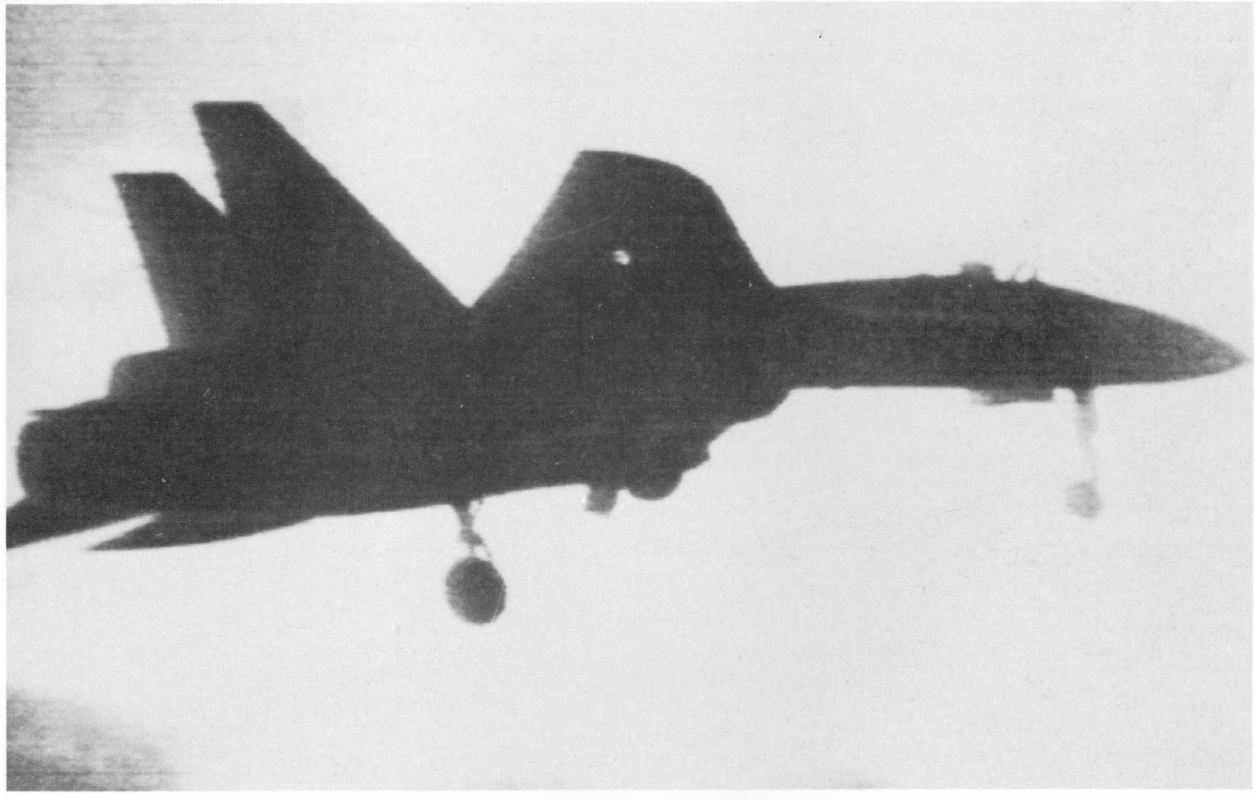

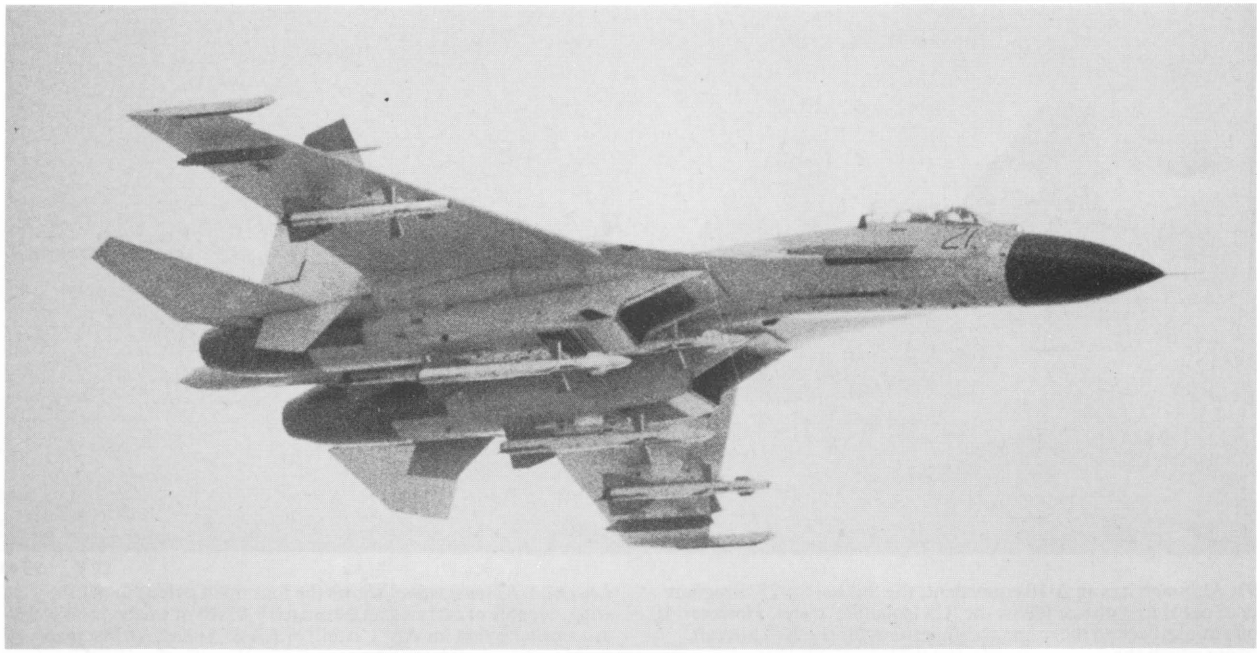

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95. The first clear photograph of the Su-27 'Flanker' was released by the Norwegian MoD in April 1987. The squared-off wing tips and extended tail cone, plus ventral fins, mark it as a production aircraft. The louvres under the engine trunking, aft of the main intakes, might be used for extra airflow during high angle-of-attack manoeuvres. Forward of the cockpit, there appears to be the same IR sensor as that fitted to the MiG-29 'Fulcrum'. The missile armament comprises three versions of the same model, the AA-10 'Alamo'. Two of them are long-range, radar-guided versions, while the other, smaller model is the IR-guided version. 'Flanker' can also carry AA-8 'Aphid' or AA-11 'Archer' AAMs and, in addition, is fitted with a six-barrelled 30mm Gatling-type cannon in the wing root fairing. (RNorAF)

96. A pair of Tu-16 'Badgers' displays the unusual wing-tip to wing-tip method of air-to-air refuelling practised by the Soviets. The aircraft nearest the camera is the 'Badger-A' tanker, while the receiver would appear to be a 'Badger-E' ('E for Ektachrome') photographic and reconnaissance version. (Royal Navy)

97. The current model of the anti-shipping version of the Tu-16 is the 'Badger-C Mod', distinguished from the original -C by the underwing pylons for the AS-6 'Kingfish' ASM seen here. The solid nose contains a 'Puff Ball' radar system. (JASDF)

98. This Tu-16 'Badger-D' version ('D for Dimples') has an array of three 'dimple' radomes under the fuselage for maritime electronic surveillance, although this is not apparent in this photograph. The 'Puff Ball' radome *is* clearly visible, as are the forward dorsal and tail gun turrets, each armed with a pair of 23mm NR-23 cannon. (US Navy)

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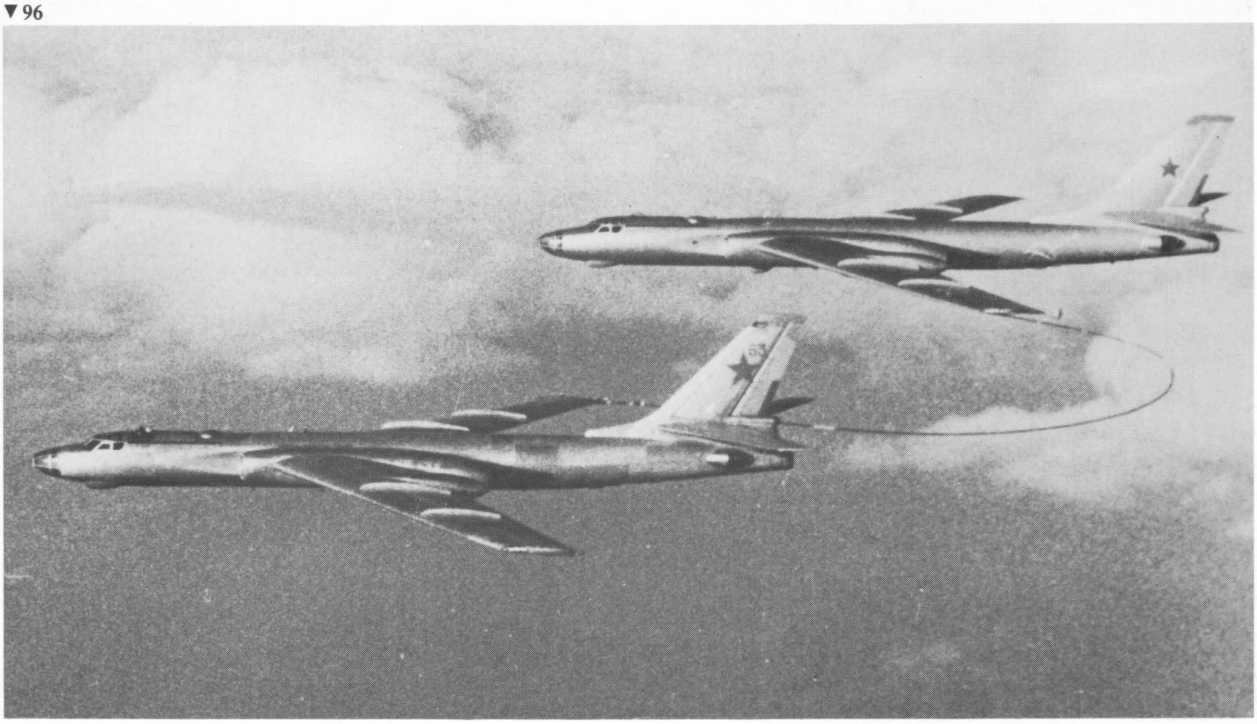

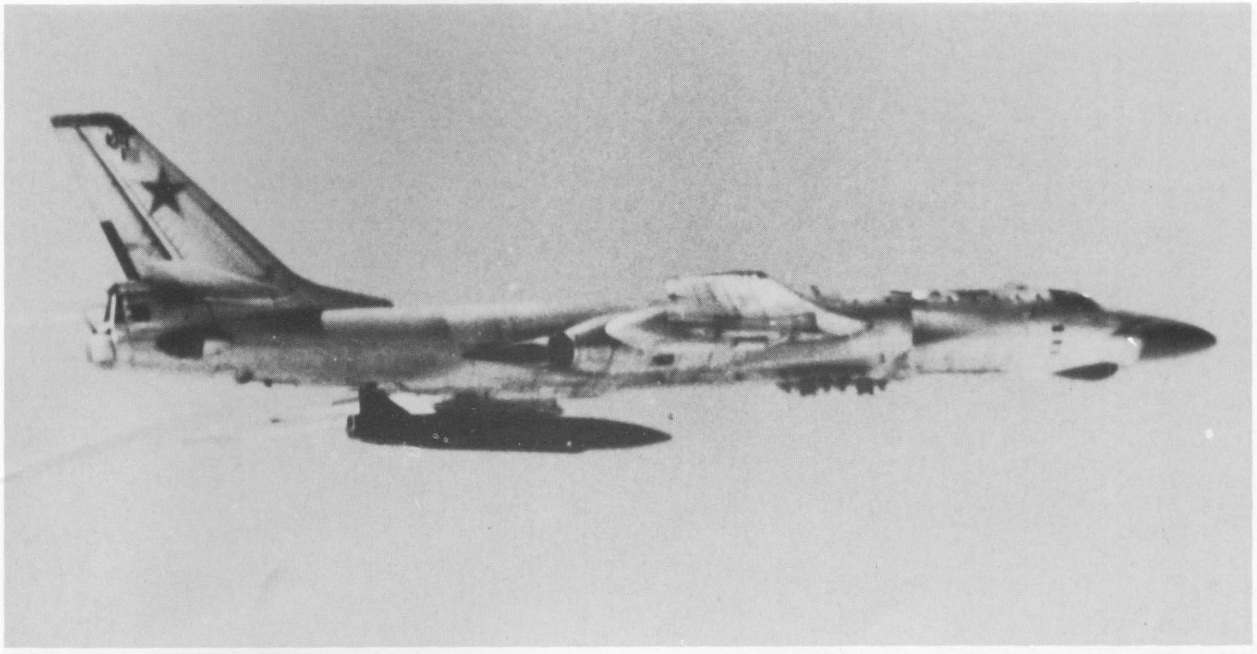

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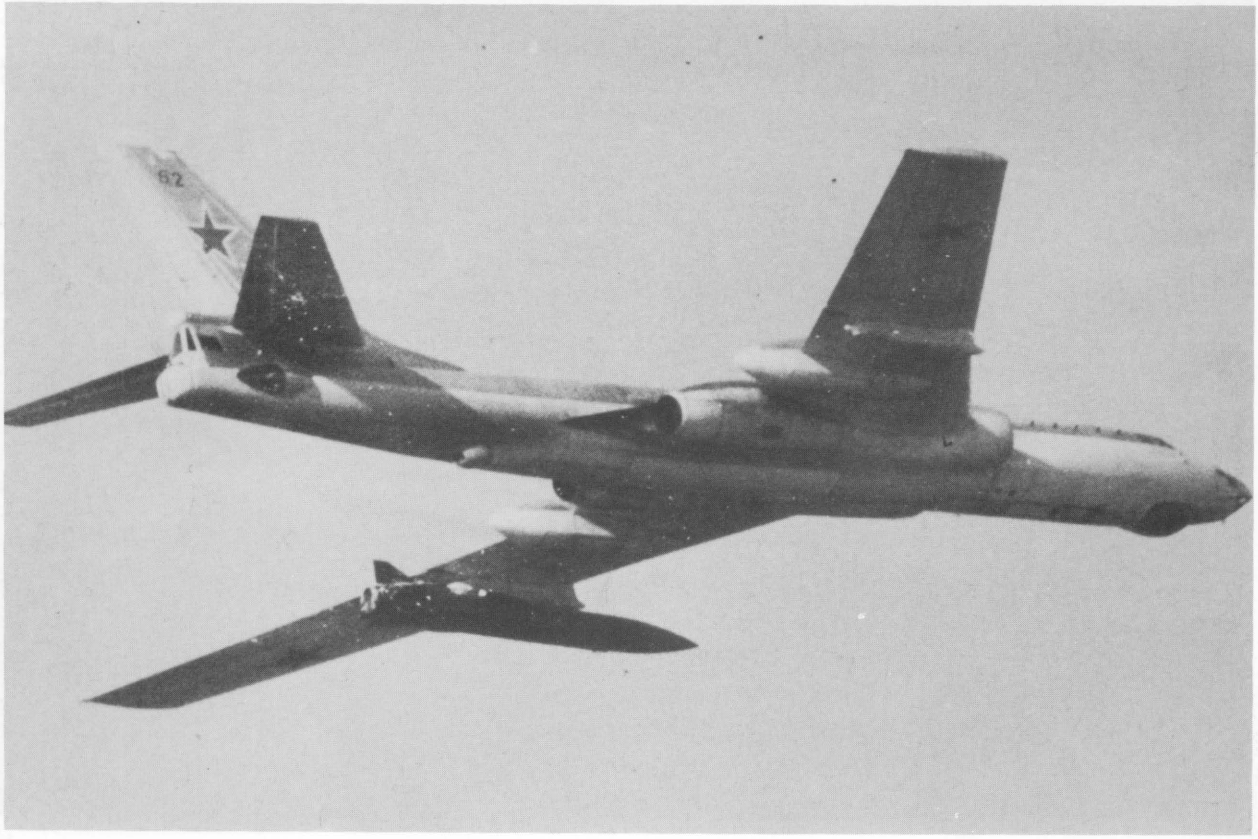

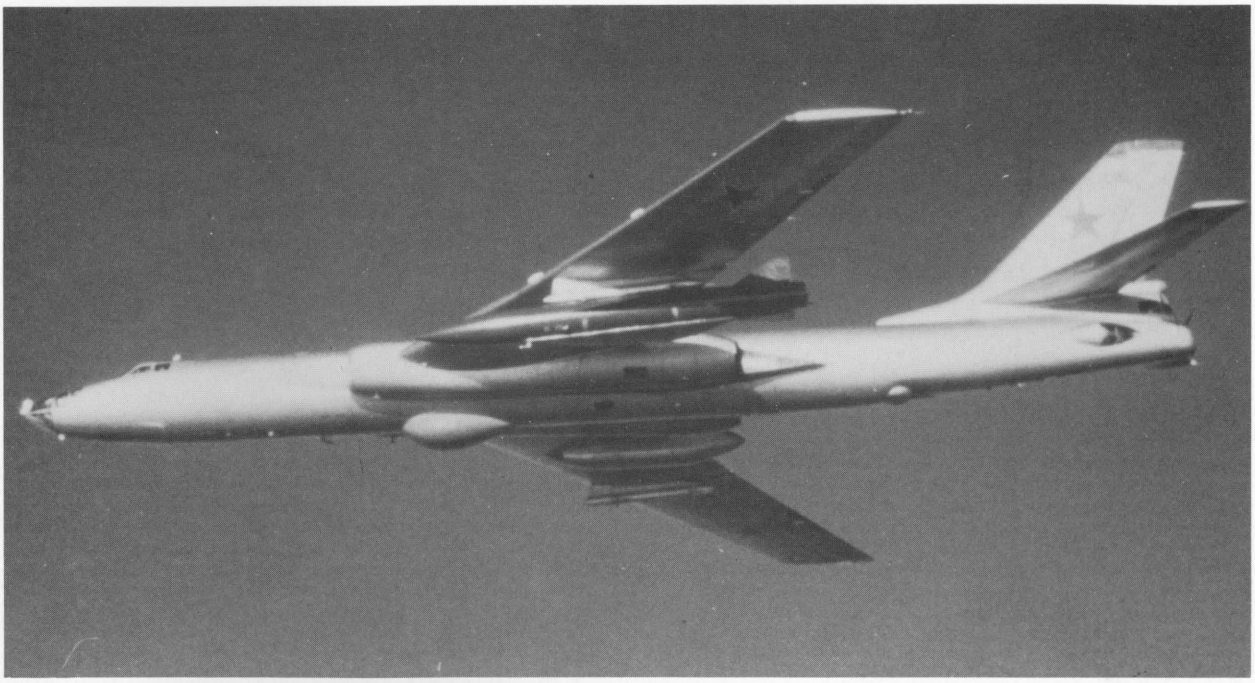

101▲

99. The three dimple radomes under the fuselage are clearly evident in this 1973 photograph of a 'Badger-D', seen overflying the fourth HMS *Ark Royal*. In addition to the rear turret housing a pair of 23mm NR-23 cannon, the 'Badger' has remote-controlled forward-upper and ventral turrets, again each with a pair of NR-23 cannon. (Royal Navy)

100. The 'Badger-G' is a conversion of the -B model adapted to carry a rocket-powered air-to-surface missile under each wing. The AS-6 'Kingfish' missile carried identifies it as a 'Badger-G Mod', but with the original chin radome. (JASDF)

101. This 'Badger-G Mod' is also seen with 'Kingfish' but has a centrally mounted underfuselage radome replacing the chin configuration. Some 85 'Badger-G' modified aircraft are estimated to be service with the Soviet Northern, Baltic and Pacific fleets. (*Flygvapnet*)

102. The Tupolev Tu-22 'Blinder' was not, in Soviet terms, built in great numbers (250 estimated) and is generally equivalent to the B-58 Hustler. This photograph shows the 'Blinder-A' basic reconnaissance bomber variant, which only entered limited service. (US DoD)

103. (Next spread) The crews of three Tu-22s being briefed by the flight commander. Their aircraft are the 'Blinder-B' versions, identified by their enlarged nose radome and by the provision of a semi-rectractable flight refuelling probe above the nose. This version was modified to carry the AS-4 'Kitchen' air-to-surface missile.

102▼

104. The Tupolev Tu-22M/Tu-26 'Backfire', seen here with an AS-4 'Kitchen' air-to-surface missile, is one of the more recently developed Soviet aircraft for which there is no direct Western equivalent. This version is the 'Backfire-B' and shows the flight refuelling probe housing above the nose, but without the probe in place. This was removed during the period of the abortive SALT 2 negotiations, implying non-strategic use of the aircraft. (*Flygvapnet* via US DoD)

105. Another view of the 'Backfire-B' clearly shows the flight refuelling probe in place. With or without this facility, the Tu-22M/Tu-26 represents a formidable airborne weapons system, capable of carrying out nuclear strikes, conventional bombing, anti-shipping strikes and reconnaissance sorties. (*Flygvapnet*)

106. The Tupolev Tu-28P 'Fiddler' is the world's largest purpose-built interceptor. With a Mach 1.6 capability, it can carry up to four AA-5 'Ash' air-to-air missiles. It is estimated that some 115 'Fiddler-Bs' remain in Soviet service today. (Via John W. R. Taylor)

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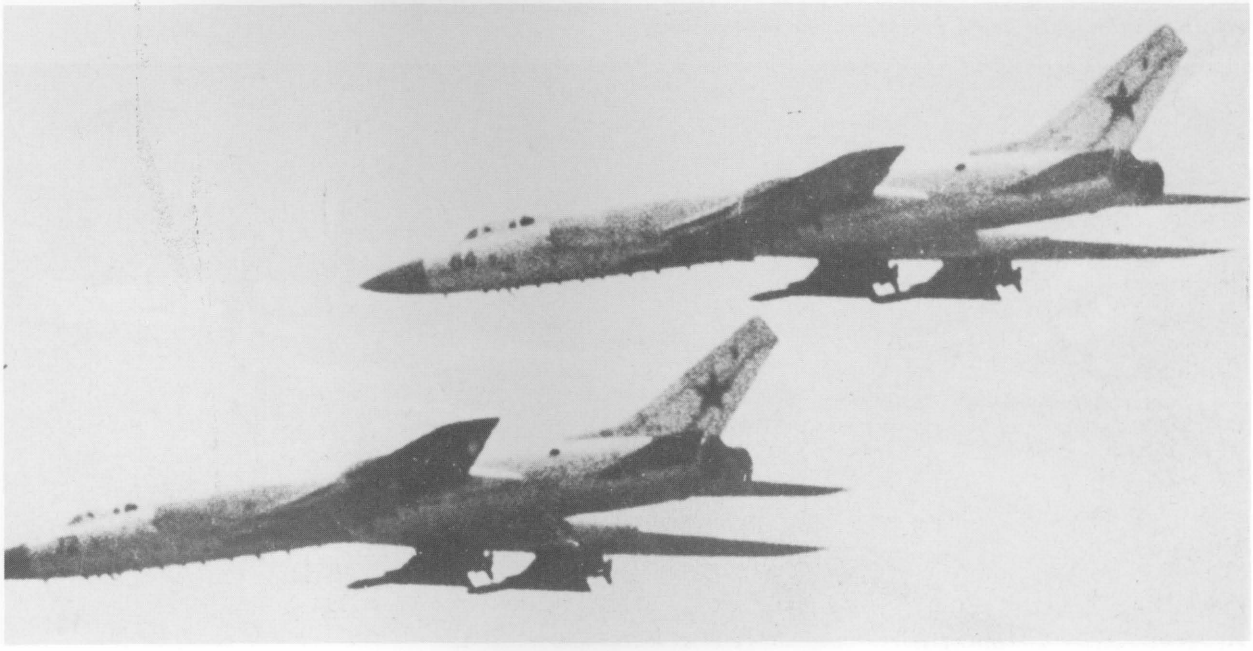
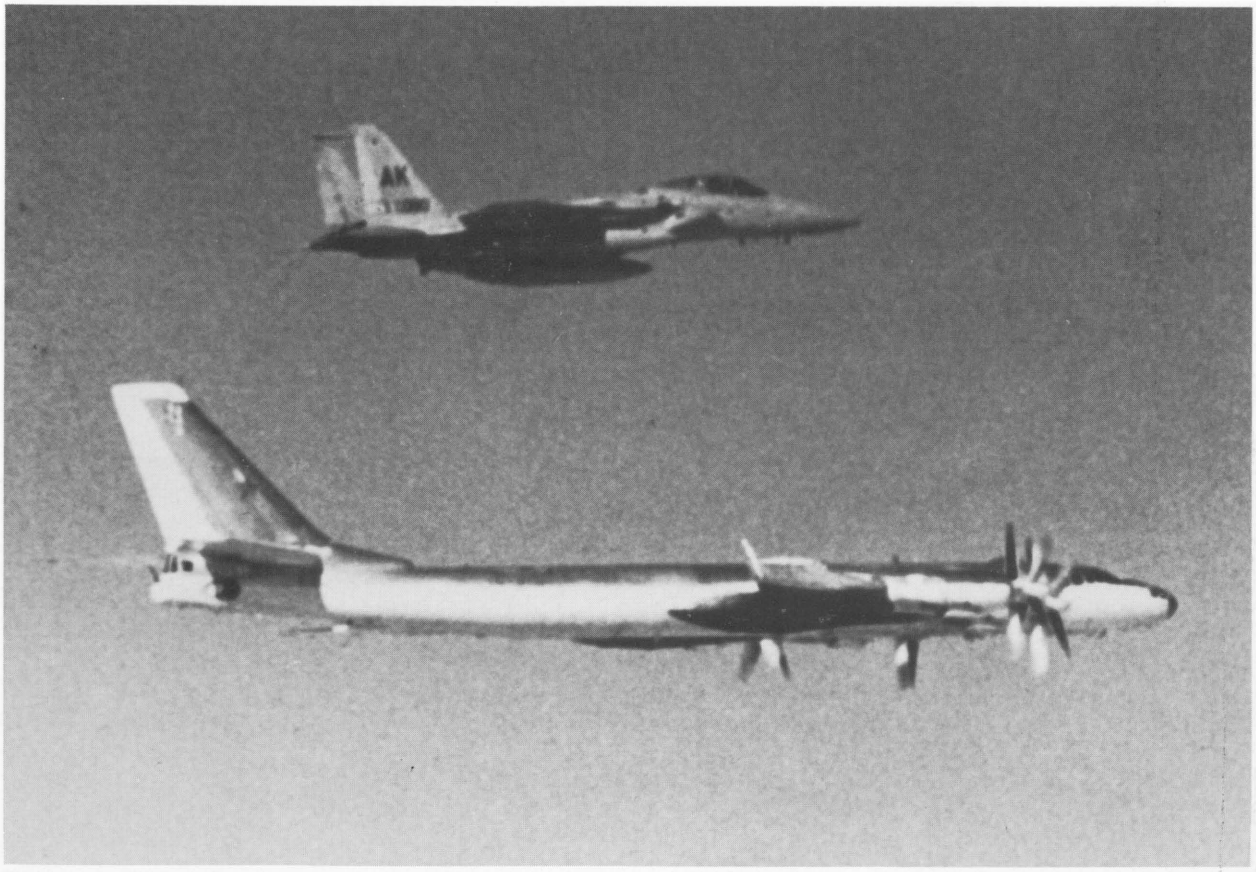
106▼





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107. The Tupolev Tu-95 'Bear-A' illustrated here represents the first version of the turboprop-powered bomber and maritime reconnaissance aircraft which entered service in the mid-1950s. Its longevity is proven by the fact this photograph was taken in September 1984 near Alaska. (USAF)

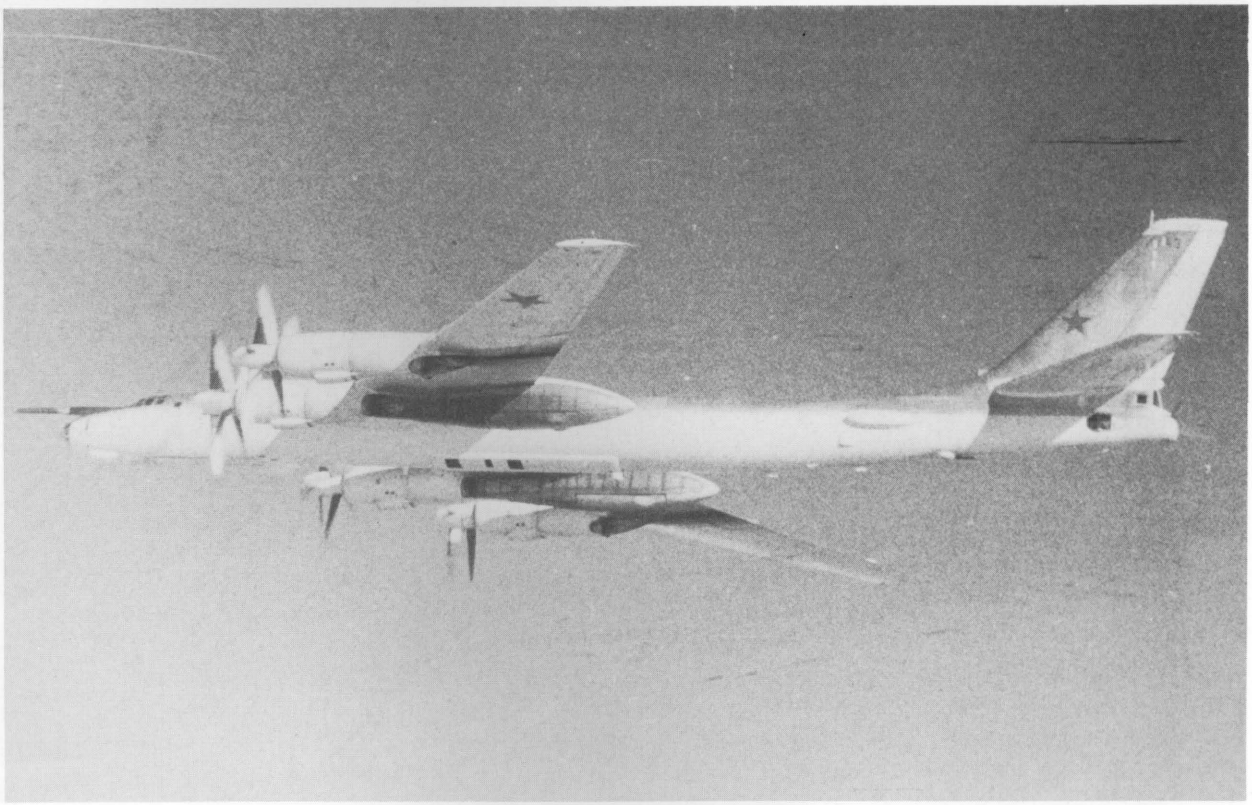
108. First observed in 1964, this version of the Tu-95 – the 'Bear-C' – has both flight-refuelling equipment and elint blisters. The latter are visible on the rear fuselage sides adjacent to the fin. (US DoD)

109. This clear view of the Tu-95 'Bear-D' maritime reconnaissance aircraft was taken after an interception by a Royal Navy Phantom FG.1 in 1978. The chin radome houses a 'Short Horn' radar. Not visible in this photograph, however, is the large underbelly radome for the 'Big Bulge' radar system. (*HMS Ark Royal*)

110. This 'Bear-E' variant is a pure reconnaissance version and very similar to the 'Bear-A' bomber. It can be identified by the camera windows in the weapons bay doors. The gun turrets contain twin 23mm cannon. (UK MoD)

▼108

109▲ 110▼

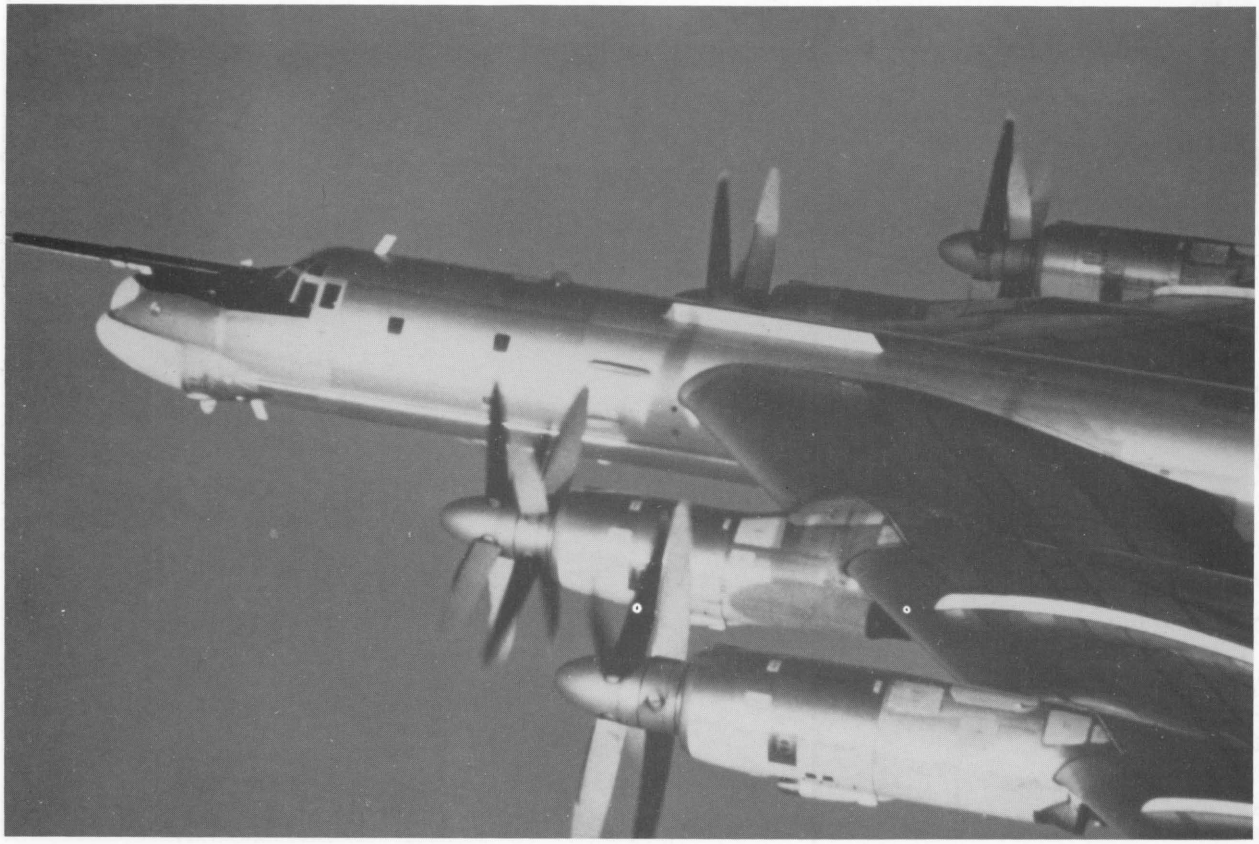


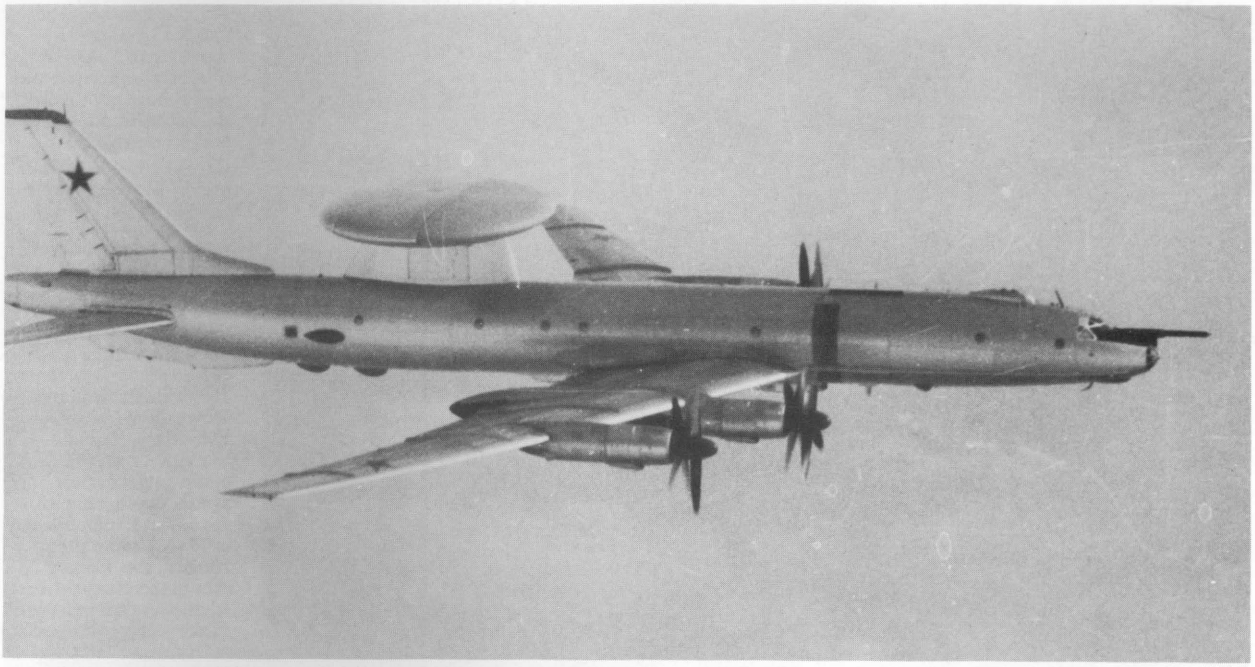
▲ 111

111. Based on the Soviet Navy's Tu-142 'Bear-F', but with a shorter fuselage, the 'Bear-H' version is back in production to carry the AS-15 'Kent' air-launched cruise missile. Some 125 'Bear-Hs' and '-G' models are in Soviet service. As this interception shot with a CF-188 Hornet shows, the 'Bear-Hs' practise simulated attack missions against North America. (Via US DoD)

112. This close-up view of a 'Bear-H' clearly shows the nose radome, the flight-refuelling probe and the four Kuznetsov NK-12MV turboprop engines and their four-bladed, contra-rotating propellers. With an estimated 4,475nm radius of action, these aircraft still represent a formidable threat. (US DoD)

▼ 112





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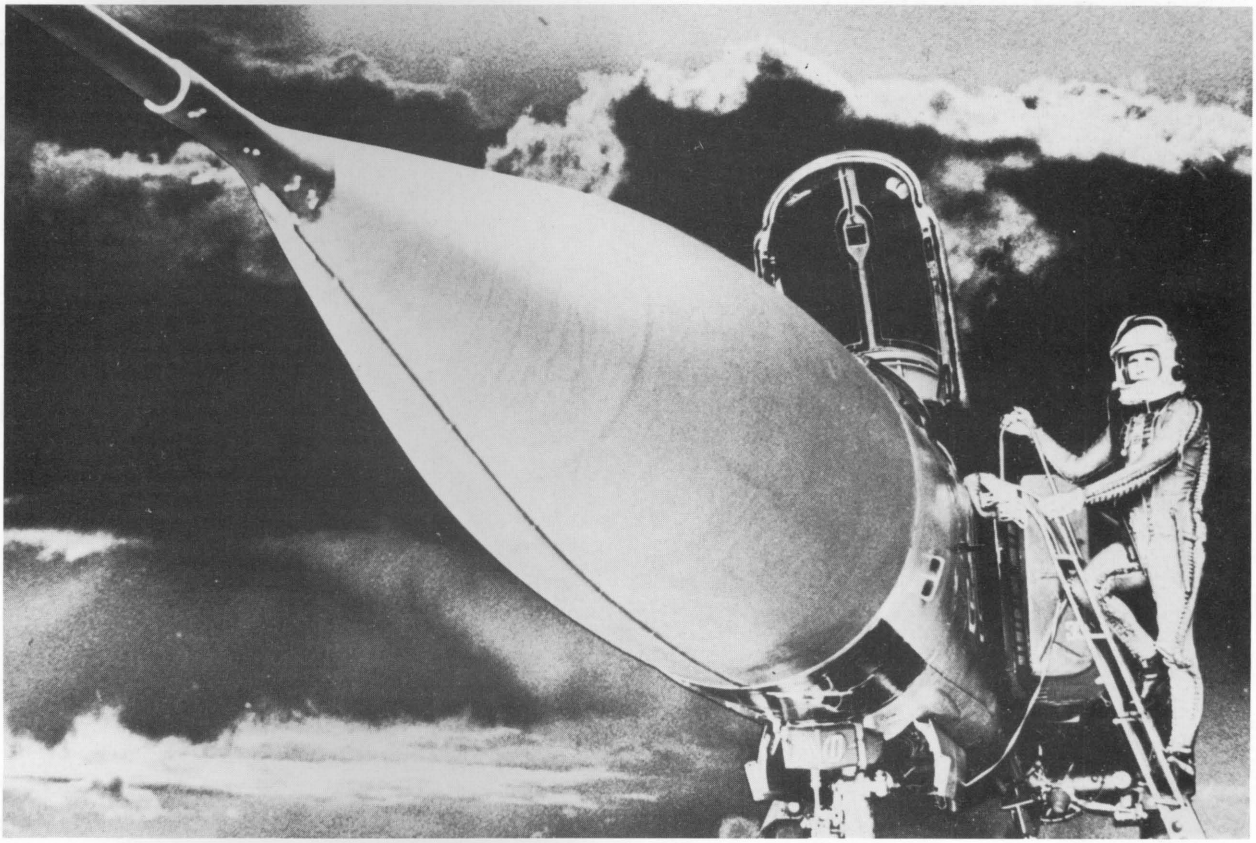
113. Derived from the Tu-114 'Cleat' airliner, the Tupolev Tu-126 'Moss' represents the first generation of Soviet airborne early warning aircraft. Their effectiveness over sea has been demonstrated when controlling advanced interceptors from an altitude of some 20,000ft, but over land their usefulness, according to the US DoD, is limited. The Tu-126's successor, the Il-76 'Mainstay', is a more potent system. (Via UK MoD)

114. This 'moody picture' of a Soviet pilot about to enter the cockpit of his Yakovlev Yak-28P 'Firebar' was issued in August 1984. It is a prime example of the way montages are still used for visual impact in officially released photographs. From this angle, the wing leading edge, wing-mounted engine and outrigger undercarriage should be clearly visible. Instead, all we can see is a sunlit, cloudy sky. (TASS)

114▼



115. This photograph, too, is a montage. It shows three Yak-28P 'Firebars' superimposed over a more photogenic sky background. On the ground are two Su-7 'Fitters', again superimposed, as is the smiling pilot. The 'Firebar' is an all-weather interceptor of somewhat advanced age, although 150 are still thought to be in service in the home defence interceptor force. (TASS)

116. This photograph shows three Yakovlev Yak-38 single-seat 'Forger-As' on the deck of the Soviet carrier *Minsk*, deployed with the Soviet Pacific Fleet in 1982. Unlike the Harrier, the 'Forger' uses pure vertical-thrust engines as well as a twin-outlet vectored thrust powerplant. The air intake door for the vertical-thrust engines is shown in the open position just aft of the cockpit. Mounted on the outer stores pylon of the nearest aircraft is a gun pod containing a two-barrelled 23mm GSh-23 cannon. (TASS)

117. This deck view of a pair of 'Forger-As' (this time on board *Novorossiysk* in 1984) shows the pilots climbing in prior to launch. Clearly visible on the aircraft are the strakes on either side of the upperfuselage air intakes, not seen on earlier aircraft. The four pylons can carry up to 7,935lb of weapons. (TASS)

◄**115**

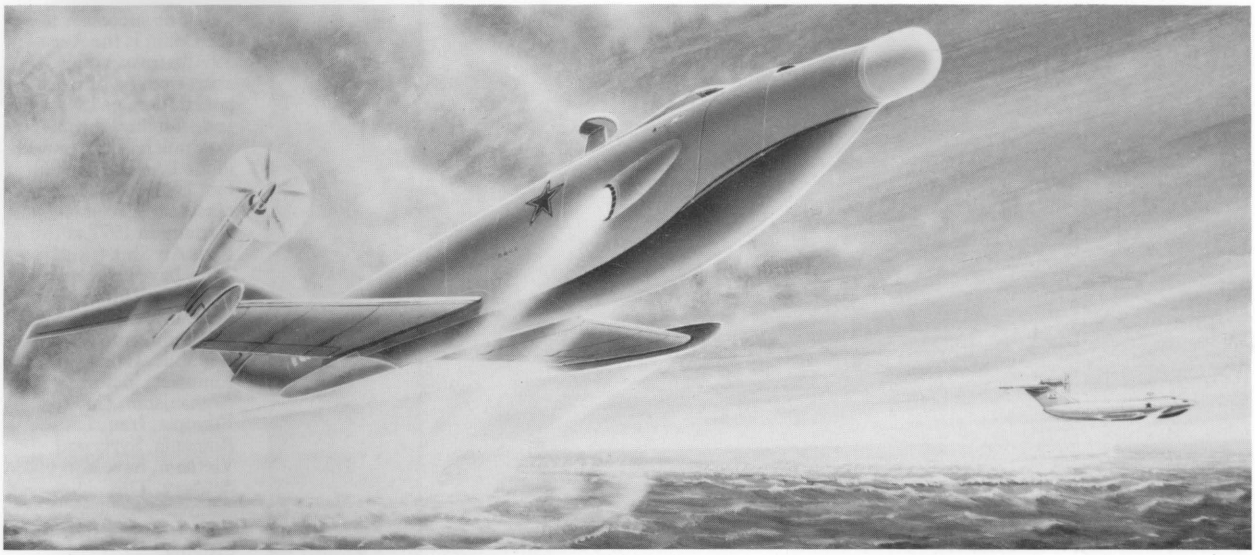
116▲ 117▼

118. This very rare photograph shows the ejection of a Soviet pilot from a 'Forger-A', while coming into land on board *Kiev* on 21 July 1985. The aircraft apparently suffered an engine failure. The pilot was picked up by a rigid inflatable craft from HMS *Newcastle* and shortly afterwards transferred to a Ka-27 'Helix', via winch. (MoD-Navy)

119. This American artist's impression shows one aspect of Soviet research and development not seriously pursued in the West – the Wing-in-Ground (WIG) effect craft. Neither 'fish nor flesh', the WIG is designed to cruise efficiently at altitudes of less than 15m, riding on a cushion of air formed between the wing and the ground during low-altitude flight. This enables the craft to carry heavy loads over long distances, especially over water. This picture shows the 'Orlan' Class WIG, the smaller of two designs under development, destined for amphibious operations. The larger (undesignated) WIG is equipped with six launch tubes and has, apparently, been designed for long-range anti-ship missions. (US DoD)

120. Czechoslovakia has long supplied training aircraft to the Soviet Union and other Warsaw Pact countries (with the notable exception of Poland). This August 1986 photograph shows the Aero L-29 Delfin (NATO code-name 'Maya'), which first flew in April 1959 still gives sterling service for basic jet training. This particular view is of Delfins of the Orenburg Higher Military Air Force College, where 'present day cadets study . . . the tactics and the up-to-date technology and master their pilot's skills'. The animated figure holding his students enthralled is, according to the caption, one Lt. Col. V. Lyamkin. (TASS)

◀**118**



119▲ 120▼

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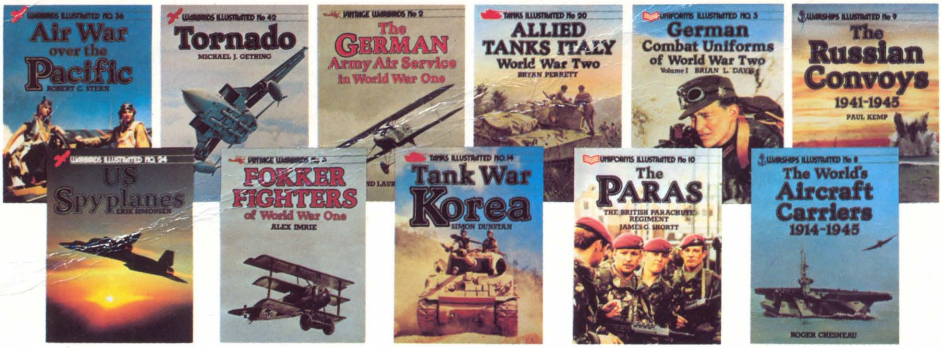
121. The successor to the Delfin is the Aero L-39 Albatross, which, apart from its bifurcated lateral fuselage intakes and straight wings, is very much in the mould of the BAe Hawk. The first L-39 was seen first outside the 'Iron Curtain' in 1977 at the Paris Air Show, and over 2,000 have been built for the Soviet Union, Czechoslovakia and the German Democratic Republic. Other countries, including Afghanistan, Cuba, Ethiopia, Iraq, Libya, Romania, Syria and Vietnam, have also taken delivery. This photograph shows the basic L-39C in Czech insignia.

122. A surprise exhibit at the 1985 Paris Air Show was this modification of an Alouette helicopter airframe from IAR of Romania. Designated the IAR-317 Airfox, the aircraft has been reconfigured as an attack helicopter (or gunship) with a new forward fuselage. The weapons are carried on the small tubular pylon seen protruding from the fuselage side underneath the 'buzz number'. A fixed armament of two 7.62mm machine guns is mounted in the lower forward fuselage. This example is understood to be a prototype, but it is not known whether production is under way. (MJG)

123. Also on display at Le Bourget in 1985 was the SOKO G-4 Super Galeb trainer. In production for and in service with the Yugoslav Air Force (not Warsaw Pact, but Eastern Bloc), the G-4 made its maiden flight in July 1978. Designed to replace the earlier G2-A Galeb and Lockheed T-33, the G-4 is powered by a licence-built version of the Rolls-Royce Viper Mk.632 turbojet engine. (MJG)



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